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WEAPONS OF CHOICE;
THE “PROPELLER VERSUS JET” CONTROVERSY
AND THE “APPROPRIATE TECHNOLOGY” DILEMMA

BY

ROBERT K. ABERNATHY

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

About The Author

Major Robert K. Abernathy was commissioned through the Air Force Reserve Officer Training Corps at the University of New Mexico in 1986. After graduating from Undergraduate Pilot Training-Helicopter, he went on to fly the HH-1H at Grand Forks AFB, North Dakota. Following MH-53J Pave Low training in 1990, Major Abernathy was assigned to the 31st Special Operations Squadron, Clark Air Base, Republic of the Philippines. Subsequent assignments include the 20th Special Operations Squadron, Hurlburt Field, Florida; 551st Special Operations Squadron and 58th Special Operations Wing, Kirtland AFB, New Mexico. Major Abernathy is a Senior Pilot with 2800 flying hours. He holds a bachelor's degree in Political Science from the University of New Mexico, a master's degree in Aeronautical Science from Embry-Riddle Aeronautical University, and a master's degree in National Security and Strategic Studies from the United States Naval War College. In the summer of 2000, Major Abernathy was assigned to the Combat Analysis Branch of the Force Structure, Resources and Requirements Directorate, Headquarters United States Special Operations Command.

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Abstract

This study examines the difficulties involved in fielding technology appropriate to the mission. Using Graham Allison’s models of decision-making as analytical lenses, the author shows how the “appropriate technology dilemma” challenged those responsible for interdicting the North Vietnamese Army along the Ho Chi Minh Trail in 1966-67. Known as the “propeller versus jet” controversy, there was a difference of opinion between the “unconventional” Air Commandos and the “conventional” Air Force as to how best to accomplish the interdiction mission. Three decades after the propeller versus jet controversy, Air Commandos still faced the appropriate technology dilemma. The 6th Special Operations Squadron is an aviation foreign internal defense advisory unit. Like their Vietnam era predecessors, the founders of the 6th Special Operations Squadron sought to field technology appropriate to their mission, while facing numerous challenges along the way. Air Force Special Operations Command faces the same dilemma as it searches for technology relevant for the future. Understanding the difficulties in fielding appropriate technology may shed some useful light for today’s military commanders, strategists, and force structure planners as they plan for the future.

Contents

	<i>Page</i>
DISCLAIMER.....	ii
ABOUT THE AUTHOR.....	iii
ACKNOWLEDGMENTS.....	iv
ABSTRACT.....	v
INTRODUCTION.....	1
BACKGROUND.....	8
Drawing the Battle Lines	8
The Trail.....	8
The Mission	11
The Players.....	13
Harry C. Aderholt	13
William W. Momyer.....	16
The Method.....	19
The Classical Model	19
The Organizational Model	20
The Governmental-Politics Model.....	20
ANALYSIS	22
The Controversy: A First Look.....	23
The Model I Lens	23
Targets Destroyed	24
Cost	27
Capability.....	30
The Controversy: A Second Look.....	34
The Model II Lens.....	34
The Controversy: A Third Look	41
The Model III Lens	41
Conclusion	46
PARALLELS	48
The 6 th Special Operations Squadron.....	49
Air Force Special Operations Forces of the Future.....	56

CONCLUSION	60
BIBLIOGRAPHY	64

Chapter 1

Introduction

If a man's trust is in a robot that will go around the earth of its own volition and utterly destroy even the largest cities on impact, he is still pitifully vulnerable to the enemy who appears on his doorstep, equipped and willing to cut his throat with a penknife, or beat him to death with a cobblestone. It is well to remember two things: no weapon is absolute, and the second of even greater import—no weapon, whose potential is once recognized as of any degree of value, ever becomes obsolete.

J.M. Cameron

By 1967, the North Vietnamese Army (NVA) had already proved to be a formidable foe for the United States as it moved troops and supplies south along the Laotian-Vietnamese border to South Vietnam down the Ho Chi Minh Trail. Most US military leaders believed that interdicting this NVA logistics lifeline was critically important to the success of US efforts in the war. The efforts of the United States Air Force (USAF) Air Commandos were central early in the interdiction campaign along the Ho Chi Minh Trail. Under the leadership of Colonel Harry C. Aderholt, a motley group of men and machines operated from Nakhon Phanom Royal Thai Air Base to spearhead the interdiction effort. Designated the 56th Air Commando Wing (ACW), this group flew what was referred to as a “junkyard air force,”¹ comprised of a myriad of World War II vintage propeller-driven aircraft. Much to the chagrin of Aderholt, many “conventional”

Air Force leaders did not believe these propeller-driven aircraft were the most appropriate technology for interdicting the NVA. General William W. Momyer, Seventh Air Force Commander in Saigon, like many other senior Air Force leaders, was “committed to a totally modernized, all-jet Air Force.”² This difference of opinion between the “unconventional” Air Commandos, led by Aderholt, and the “conventional” Air Force leadership as to the appropriate technology for the interdiction mission formed the basis of what would become known as the “propeller versus jet” controversy.³ This study examines the propeller versus jet controversy as an example of the difficulties involved in fielding technology appropriate to the mission, when the mission does not comport with that of the prevailing force. Understanding these difficulties may shed some useful light for today’s military strategists as the “appropriate technology” dilemma is as evident today as it was over thirty years ago. Matching means to ends, or put another way, choosing the “right tool for the job,” is paramount if one is to successfully accomplish a tasked mission. To do otherwise may result in, at best, an ineffective military force and wasted expenditure of taxpayers money or, at worse, failed military operations, loss of national security objectives, and unwarranted loss of life. Commanders, strategists, and force structure planners must all be aware of the challenges to fielding technology that is appropriate to the mission. This study takes the first step in helping today’s military leaders understand those challenges and potential pitfalls.

¹ Michael E. Haas, *Air Commando! 1950-1975: Twenty-five years at the Tip of the Spear*. (Hurlburt Field, Fla.: Air Force Special Operations Command, 1994), 58.

² *Ibid.*, 59.

³ *Ibid.*, 58.

To understand the propeller versus jet controversy, it is necessary to present a timeline of events leading up to and including the air interdiction campaign along the Ho Chi Minh Trail. This will also frame the discussion for further analysis. First, North Vietnam began its infiltration of the South to support the Viet Cong led insurgency in 1959. The first group of infiltrators, led by a man named Vo Bam, was a unit designated the 559th Transportation Group. The numbers in the unit name signified the month and year Hanoi issued orders to aid the insurgency. “In early 1961, with the approval from the Laotian Communists, Hanoi made its final decision to extend the [Ho Chi Minh] Trail into Laos.”⁴ At approximately the same time, the recently inaugurated President John F. Kennedy was advised of these developments. Kennedy was very interested in counterinsurgency operations and viewed the situation in Southeast Asia as a laboratory for this type of warfare.⁵ In late 1961, the Air Force deployed an Air Commando detachment of propeller-driven aircraft, code-named Farm Gate, to South Vietnam to train South Vietnamese pilots in counterinsurgency warfare.⁶ At the same time, Aderholt, working in concert with the US Central Intelligence Agency (CIA), was in Southeast Asia directing efforts against the Laotian communist forces known as the Pathet Lao. Early 1964 saw the deployment of another Air Commando detachment to Southeast Asia.

⁴ John Prados, *The Blood Road; The Ho Chi Minh Trail and the Vietnam War*, (New York: John Wiley and Sons, 1999), 15.

⁵ *Ibid.*, 13-39.

⁶ The Air Commando detachment code-named Farm Gate was part of a larger organization known as Jungle Jim that was based at Eglin AFB, Florida. Established in early 1961, Jungle Jim was created to train USAF, and subsequently host country, personnel in the use of aviation to counterinsurgency operations (referred to by then Defense Secretary Robert McNamara as “sub-limited war”). See William W. Momyer, *Air Power in Three Wars* (Washington, D.C.: Department of the Air Force, 1978), 10-11.

Code-named Water Pump, this detachment was sent to train Lao and Thai pilots in counterinsurgency operations.⁷

It wasn't until March 1965 that the US entered into the war in great force with Operation Rolling Thunder. Operation Rolling Thunder was focused on the sustained bombing of interdiction targets in North Vietnam and continued until November 1968. At the same time (1966-67), Aderholt led his Air Commandos in the interdiction effort along the Ho Chi Minh Trail and it was this period of time that defined the propeller versus jet controversy. After President Lyndon Johnson halted all bombing in North Vietnam in November 1968, greater attention turned to the Ho Chi Minh Trail with a series of air interdiction campaigns code-named Commando Hunt that lasted until 1972. The Commando Hunt efforts consisted of largely "front-line" assets that included jet fighters and heavy jet bombers.⁸

Aderholt's efforts along the Ho Chi Minh Trail that preceded Commando Hunt were largely directed in support of counterinsurgency while Commando Hunt focused on a more conventional enemy force. This point is critical for the reader to understand. Because insurgent forces typically operate in small units exploiting the cover of terrain and population to employ "hit and run" guerilla tactics, air interdiction intended to starve an insurgency is qualitatively different than air interdiction intended to degrade military operations by a more conventional enemy. The former might best be performed by

See also, Michael E. Haas, *Apollo's Warriors; United States Air Force Special Operations during the Cold War* (Maxwell AFB, Ala.: Air University Press, 1997), 220.

⁷ Warren A. Trest, *Air Commando One; Heinie Aderholt and America's Secret Air Wars* (Washington, D.C.: Smithsonian Institution Press, 2000), 8-10.

⁸ Eduard Mark, *Aerial Interdiction in Three Wars* (Washington, D.C.: Center for Air Force History, 1994), 330-335.

propeller-driven aircraft that are slower in speed, long-loiter and have accurate delivery platforms. The latter might require faster jet aircraft owing to the anti-aircraft artillery threat of a better-armed enemy force.

Chapter 2 will commence the examination with a review of the infamous Ho Chi Minh Trail and highlight some of the challenges the NVA presented for the US along the Laotian/Vietnamese border. An examination of the Air Commandos' interdiction mission will follow with an emphasis on the various weapons platforms used to accomplish the mission. Next, the focus will turn to the two Air Force officers most closely associated with the propeller versus jet controversy, Colonel Aderholt and General Momyer. Their background and experiences will be studied in order to provide context for the arguments made by each of these men which followed from their individual experiences and perspectives. To understand their perspectives and their arguments, a method for examining their decision-making process is called for. Graham T. Allison's Models of Decision-Making will serve as the "lenses" through which the controversy may be examined. Chapter 2 will conclude with a study of each of the models that Allison developed. Originally used as a method to evaluate the decision-making process during the Cuban Missile Crisis, these models will provide the insight on the factors that influenced the propeller versus jet controversy.

The heart of the analysis, chapter 3 examines the controversy through Allison's models. The Classical Model is used to examine measures of effectiveness for the interdiction effort. The Organizational Model examines organizational influences on Momyer and Aderholt. Finally, the Governmental Politics Model examines political influences on the appropriate technology dilemma. Each lens offers varying explanations

of how Momyer and Aderholt each believed their weapons of choice represented the most appropriate technology for the interdiction mission.

In Chapter 4, the study will present some modern day parallels to the propeller versus jet controversy to demonstrate how the appropriate technology dilemma is alive and well. It will begin with an examination of the 6th Special Operations Squadron (SOS) and the continual struggles that the squadron endures to field its weapons of choice. Designed as an aviation foreign internal defense (FID) squadron, the 6th SOS founders sought to marry the appropriate technology to the mission. Next, chapter 4 will examine the future plans for Air Force Special Operations Forces (AFSOF) to show how the propeller versus jet controversy is apparent today every bit as much as it was over three decades ago. Chapter 5 will conclude the study with some observations and cautionary notes with regard to fielding appropriate military technology.

There are some limitations to this study. First, this is not a study in what missions are appropriate to Special Operations Forces (SOF); rather, it is an examination of selected weapon systems used by SOF and their appropriateness to the missions charged to SOF. Second, the examination focuses on the Ho Chi Minh Trail as it was during the period of the propeller versus jet controversy—1966-67. Third, the evaluation of relative effectiveness of air interdiction along the Ho Chi Minh Trail depends upon US intelligence estimates unconfirmed by NVA records. Consequently, the lack of access to NVA records presents an unfortunate limitation. Finally, this is not a study in the differences between *high-tech* and *low-tech* weapons; rather, it is a study in *appropriate* military technology. To that end, arguments are based on the following assumed

definition: “Appropriate technology” is that technology which is best suited for the tasked mission and the environment in which the mission is accomplished.

Chapter 2

Background

To have command of the air means to be able to cut an enemy's army and navy off from their basis of operation and nullify their chances of winning the war.

Douhet

The war in Southeast Asia is a subject that should not be wholly unfamiliar to the reader. Many volumes were written about the conflict even before American forces returned home. Similarly, the military efforts along the Ho Chi Minh Trail have been well documented.⁹ The intent of this study is not simply to recount historical events; rather, it is intended to present an historical analysis of specific events central to the “appropriate technology” dilemma as well as examine the evolution of ideas and concepts that defined the “propeller versus jet” controversy.

Drawing the Battle Lines

The Trail

Geography, topography, and climate all significantly influenced the planning, operations, and impact of air interdiction operations along the Ho Chi Minh Trail. The terrain that runs along the Laotian border with North and South Vietnam is rugged and

mountainous. Prominent is the Annamite Mountain Range that forms a natural boundary between Laos and North Vietnam. The mountains rise to 8,500 feet and are jungle covered with areas of jagged karst, or limestone outcroppings. Vehicular traffic is constrained to a limited number of major mountain passes. These are the Mu Gia Pass, the Ban Karai Pass and the Ban Raving Pass. Although this might seem to the advantage of airpower, the passes are frequently shrouded in clouds. Beyond the passes is the seemingly endless tropical forest of the Laotian Panhandle, which provides a triple-canopy roof over much of the trail severely limiting detection and destruction of targets from the air.¹⁰

The climate is dominated by two seasonal phenomena—the southwest and northeast monsoons. The former dominates weather patterns from June to October and the latter dominates November to May. The southwest monsoon causes the wet season of southern Laos whereas the northeast monsoon leads to a dry season. “Annual rainfall varies from as little as 50 inches to more than 200. Even at the height of the rainy season the variation in precipitation is considerable: monthly averages range from 8 to 50 inches.”¹¹

The latter were very difficult during the wet southwest monsoon because the shifting weather patterns had a significant impact on how the Trail was used by the NVA and on aerial operations against the Trail. Due to generally very limited visibility and low cloud cover, often well below safe altitudes for flight, this period hindered air attacks on the Trail. The NVA were unable to capitalize on the hindered air operations because it was

⁹ See, for example, John Prados, *The Blood Road; The Ho Chi Minh Trail and the Vietnam War* (New York: John Wiley and Sons, 1999).

¹⁰ Earl H. Tilford, Jr., *Search and Rescue in Southeast Asia, 1961-1975* (Washington, D.C.: Office of Air Force History, United States Air Force, 1980), 31-32, 35-36.

extremely difficult for them to move much war materiel in the wet, muddy conditions. As a result, the communists concentrated their efforts to move men and materiel south on the trail to the northeast monsoon, or dry season. Aerial interdiction was planned and executed accordingly.

The Ho Chi Minh Trail was much more than the name implies. Rather than a primitive trail, it was an intricate web of roads and trails that traversed the terrain along the Laotian-Vietnamese border. The Trail had its origins in World War II, when the Viet Minh used the same jungle paths in their resistance efforts against Japanese occupation forces. The road network (originally mere footpaths) extended from the Mu Gia Pass in the north, southward along the heavily forested western slopes of the Annamite Mountains, into the tri-border area of Laos, Cambodia, and Vietnam. Originally, the roads were primitive by Western standards, consisting of 18-foot wide tracks, but as time passed the communists made increased use of heavy equipment to maintain existing roads and make new ones. “The logistical strategy of the North Vietnamese depended on the extensive network of roads in Laos, which they indefatigably extended each dry season. In 1966, the Ho Chi Minh Trail consisted of 820 miles of fair-weather roads. This grew to over 2700 miles of roads by 1971.”¹²

The Ho Chi Minh Trail ran through numerous military districts in Laos known as Binh Traus. Established by the North Vietnamese, each Binh Trau had a military commander responsible for the district and possessed its own transportation, ground defense personnel, and air defenses. Supplies were transferred from one Binh Trau to the

¹¹ Mark, 330.

¹² *Ibid.*, 331.

next as they made their way down the Trail. Numerous transfers between the semi-autonomous units made the logistical flow complex, but allowed each unit to become familiar with the terrain and roads within its own area. Almost all of the infiltration movement was at night and by early morning, the materiel was unloaded and dispersed for concealment.¹³ “Tonnage moving along the Trail grew from a hundred tons a week in 1963 to over ten thousand by 1970. [The units in each Binh Trau took advantage of the] five main roads, twenty-nine branch roads, and many, many cutoffs and by-passes.”¹⁴ These astounding figures led one author to comment: “By any standard of human endeavor...what happened on the Ho Chi Minh Trail must rank high among the works of men and women.”¹⁵

The Mission

As Douhet suggests in the chapter’s opening citation, if the enemy’s logistics lifeline can be severed, it may nullify his chances of winning the war by reducing his capability to wage war. This was the concept of operation underwriting the interdiction mission along the Ho Chi Minh Trail. The flow of North Vietnamese men, equipment, and supplies had to be cut off before it reached forces in South Vietnam. However, recall from the timeline given in chapter one, during 1966-67, the Air Force’s primary focus was on the bombing campaign in North Vietnam and close support of ground operations in South

¹³ *Ibid.*, 331-36.

¹⁴ Prados, 374. Prados cites recent Vietnamese accounts of the Trail in reporting these figures. For perspective, Prados urges a comparison to American requirements to sustain its soldiers in the field. “US Army staff manuals for this period (late 1965) envisioned a requirement for roughly 50 pounds a day of supplies to keep a soldier in the field. At that rate, the 184,000 US troops in Vietnam at the end of 1965 were consuming...more than ten times Hanoi’s average.” See Prados’ note on page 374.

¹⁵ *Ibid.*

Vietnam. Therefore, the air interdiction effort along the Ho Chi Minh Trail, for the conventional Air Force, was secondary. For the Air Commandos, the interdiction mission became their primary focus.

The missions of the 56th ACW were varied. They included support and training for the Royal Thai Air Force (RTAF) and the Royal Laotian Air Force (RLAF) in combat and non-combat operations. They also included supporting and conducting counterinsurgency operations to include the interdiction of insurgent infiltrators.¹⁶ “Combat operations concentrated primarily in Laos with emphasis placed on stopping the flow of traffic along the Ho Chi Minh Trail.”¹⁷

To accomplish this mission, the 56th ACW employed a variety of aircraft including the AT-28 trainer/fighter, C-123 twin-engined short takeoff and landing transport, UH-1 single-engined helicopter, the U-10 liaison aircraft, the A-26A attack/bomber,¹⁸ and the A-1 attack aircraft.¹⁹

¹⁶ *Insurgency* is defined as “an organized movement aimed at the overthrow of a constituted government through use of subversion and armed conflict.” (See *Military Operations Other Than War*, Air Force Doctrine Document 2-3, 5 October 1996.) *Support to counterinsurgency* is defined as “support provided to a government in the military, paramilitary, political, economic, psychological, and civic actions it undertakes to defeat insurgency. (See *Joint Doctrine for Military Operations Other Than War*, Joint Publication 3-07, 16 June 1995.) *Foreign internal defense*, a euphemism for counterinsurgency, is defined as “participation by US civilian and military agencies in any of the action programs taken by the host government to free and protect its society from subversion, lawlessness, and insurgency. (See *Special Operations in Peace and War*, United States Special Operations Command Publication 1, 25 January 1996.)

¹⁷ Prados, 374.

¹⁸ The A-26A was originally the B-26K bomber. Haas wrote “An early glitch arose prior to their arrival when the Thai government expressed its concern at having foreign ‘bombers’ on its soil. [The] problem was finessed smoothly when Secretary of the Air Force Harold Brown simply redesignated [them] as ‘attack’ aircraft, hence their new designator—A26A.” See Haas, *Apollo’s Warriors*, p 196.

¹⁹ *Ibid.*, 196-203.

The responsibility for of the interdiction mission certainly did not rest solely with the 56th ACW. The Air Commandos did not alone have the assets to combat the ever increasing and demanding interdiction campaign. The Ho Chi Minh Trail may have been secondary in the minds of the conventional Air Force, but nevertheless, a great deal of jet aircraft were dedicated to reducing the logistics flow of men and supplies to the Viet Cong. A variety of jet fighters and bombers from 7th Air Force were employed in the campaign. Fighter assets included the F-100, F-105, and the F-4. Bomber assets used were the B-57 Canberra and the B-52 Stratofortress.²⁰

Both propeller-driven aircraft and jets were used in the interdiction effort along the Ho Chi Minh Trail. The proper role and efficacy of these aircraft types were debated among two very individualistic military officers, each with a unique perspective on air warfare specifically and the military in general.

The Players

Harry C. Aderholt

A native of Alabama, Brigadier General Harry C. “Heinie” Aderholt was one of seven children that were raised in Birmingham. His father was a hard-working fireman for the railroad until his early death in a train crash in 1929. The younger Aderholt was only nine years old at the time. At age 16, Aderholt quit school to support his family but was convinced by his principal to return and finish high school. His schoolteachers described him as industrious and outgoing. Family values were instilled in Aderholt at an

²⁰ Momyer, *Air Power in Three Wars* (Washington, D.C.: Department of the Air Force, 1978), 270-71.

early age and stayed with him in later life. He later commented, “You can’t teach integrity, either you’ve got it or you don’t.”²¹ Following high school, Aderholt played semi-professional baseball and worked at a steel mill in Birmingham. When the Japanese attacked Pearl Harbor, Aderholt and his four brothers decided to join the military and serve their country. He never graduated from college or a service academy.²²

Aderholt began his military service as a cadet in the aviation cadet program in early 1942. Upon completion of the program in May 1943, he was tendered a commission as a second lieutenant in the US Army Air Corps and awarded his pilot wings. Aderholt’s first experience with combat came in World War II where he served in North Africa and Italy as a B-17 and C-47 pilot.²³ He believed in doing the best job one could at whatever was the chosen career field. “You don’t have to be any one thing. Some people are not made to be fighter pilots and some are not made to be bomber pilots. I don’t care what they do, as long as it is what they are best at.”²⁴

Following his duty in Europe and North Africa, Aderholt served in numerous company and field grade assignments fulfilling operations and training roles. His career focused on special operations in support of the US military and the Central Intelligence Agency (CIA). During the early part of the Korean War he commanded a Special Air Warfare Detachment. “Air Commandos, Army Special Forces, Navy frogmen, British Royal Marines, the CIA, and South Korean partisans combined to run a substantial

²¹ Brig Gen Harry C. Aderholt, USAF (Ret.), interviewed by author, Fort Walton Beach, Fla., 11 April 2000.

²² Trest, 1-3.

²³ Brig Gen Harry C. Aderholt, USAF Oral History Interview (U) (K239.0512-1716), 15 August 1986, vii. (Secret) Information extracted is unclassified.

²⁴ Aderholt, interviewed by author, 11 April 2000.

unconventional warfare operation behind enemy lines during the war.”²⁵ Aderholt’s staff assignments included duty with the 18th Air Force, United States Air Forces Europe (USAFE), and the Air Staff specializing in intelligence, unconventional warfare planning, and special warfare.

Aderholt became commander of the 1095th Operational Evaluation Training Group in 1960 where he helped pioneer techniques for special operations air warfare. Aderholt was also instrumental in the development of Lima Sites, airfields in Laos used to support counterinsurgency operations. “These fields were used throughout Southeast Asia as support sites for special warfare operations and as Jolly Green helicopter forward staging bases for rescue and recovery operations in Laos and North Vietnam.”²⁶ Following a short tour as Special Advisor to the Commander of the USAF Special Air Warfare Center, he served as Vice Commander and then Commander of the 1st Air Commando Wing (now designated the 16th Special Operations Wing at Hurlburt Field, Florida) until August 1965.

In 1965, Aderholt transferred to the Pacific, where he joined the US Military Assistance Command, Vietnam (MAC-V). There he conceived and activated the Joint Personnel Recovery Center (JPRC) in Saigon. The JPRC was a centralized rescue and recovery coordination center established to oversee the rescue efforts in Southeast Asia. In December 1966, Aderholt joined the Air Commandos at Nakhom Phanom Royal Thai Air Base, Thailand as commander. In the spring of 1967, Headquarters (HQ) Pacific Air Forces (PACAF) selected Aderholt to combine selected Air Commando squadrons and

²⁵ Haas, *Air Commando!*, 12.

²⁶ Aderholt, Oral History, vii.

activate the 56th Air Commando Wing.²⁷ It was during this tour of duty (late 1966-1967) that Aderholt's Air Commandos fought the North Vietnamese along the Ho Chi Minh Trail. It was also during this assignment that he and General Momyer clashed in the propeller versus jet controversy.

As Warren Trest writes: "A hard-charging commander like Aderholt (who epitomized the Air Commando mystique and had never flown high-performance jet fighters) was antithetical to the Momyers of the Air Force—the architects of 'higher and faster' tactical air power calculated to respond to any level of hostilities."²⁸ Aderholt always endeavored to meet the challenges before him. Integrity, determination, and a "can-do" attitude were his touchstones. His career followed the path of a special operations warrior with a unique focus on unconventional warfare. Aderholt's experiences provided him a perspective that stood in stark contrast to that of Momyer.

William W. Momyer

Only four years Aderholt's senior, General William W. "Spike" Momyer was born in Muskogee, Oklahoma. He was born the eldest of four children to a demanding father, who was an attorney and law professor, and a schoolteacher mother. His interest in aviation began at an early age when he would go to Hatbox Airfield in Muskogee to climb through old World War I aircraft. On one occasion while Momyer was at the airfield, Charles Lindberg landed in the Spirit of St. Louis, which made a lasting impression on Momyer. When he graduated from college, he made the decision to join the Army to fly.

²⁷ *Ibid.*

²⁸ Trest, 3.

Momyer, like Aderholt, was a Flying Cadet. He received his commission as a second lieutenant in the Air Reserve in 1939. Momyer always wanted to fly pursuit aircraft. “I wanted to fly by myself. I didn’t want another guy telling me how to fly, and I think that is characteristic of fighter pilots. It was inconceivable to me to end up in bombers.”²⁹ Momyer believed there were certain traits that defined the fighter pilot. These were confidence, aggressiveness, and determination. Momyer also believed that an officer should remain within his chosen career field for the duration of his military service. “I think people ought to be trained from the day that they’re second lieutenants in TAC or SAC (Tactical Air Command; Strategic Air Command) and stay in those fields their whole career.”³⁰ Momyer’s career largely followed this ideal. He first served in North Africa during World War II in P-40s. The primacy of air-to-air combat was paramount to Momyer. “The war, to the fighter pilot, is up there against that enemy aircraft. Who is going to hoist [pilots up] around the club for knocking out three or four tanks; but let him shoot down a couple of airplanes, and the whole place lights up.”³¹ Following his service in North Africa, Momyer’s subsequent assignments included various duties as a company and field grade officer through 1954.

In 1954, Momyer took command of the 314th Air Division. With respect to leadership, Momyer believed a commander should search out the best people for the job and trust them to do that job. “I think that’s part of leadership, recognizing whether you’ve got people that you can put your confidence in and giving them that confidence,

²⁹ General William W. Momyer, USAF Oral History Interview (K239.0512-1068), 31 January 1977, 13 and 31.

³⁰ General William W. Momyer, USAF Oral History Interview (K239.0512-1468), 9 September 1981, 10.

letting them do the job.”³² Command billets that followed the 314th Air Division included the 312th Fighter Bomber Wing and the 832nd Air Division. His staff assignments included Director of Plans at HQ Tactical Air Command (TAC) and Director of Operational Requirements, HQ USAF. (When Momyer looked back at his staff duty that followed the Vietnam War, he was most proud of his accomplishments in modernizing the Air Force with jets such as the F-15 and the A-10.) Following his duty at the Pentagon, Momyer returned to a command billet as Commander, Air Training Command. In 1966 he became Commander, Seventh Air Force in Saigon and Deputy Commander for Air Operations, MAC-V (Military Assistance Command-Vietnam).³³ This assignment brought Momyer one of his most challenging tasks—the air war in Southeast Asia.

Momyer was raised in an exacting home and his life reflected that discipline. Individualistic, aggressive, and self-assured, Momyer epitomized the mystique of the fighter pilot. His bulldog determination and pursuit for excellence showed in how he led his people and how he accomplished the mission. These traits were apparent in his dealings with Aderholt.

These biographical sketches show that Aderholt’s career followed a path of Air Commandos and unconventional warfare and Momyer’s followed one of fighter pilots and tactical airpower. These differing backgrounds provided each man with his unique

³¹ Momyer, Oral History, 31 January 1977, 27.

³² Momyer, Oral History, 9 September 1981, 10.

³³ William Wallace Momyer Papers. 1914-1973. USAF Historical Research Agency, Maxwell AFB, Ala.

perspective on air warfare and how (and what type) airpower should be employed to accomplish the mission.

The Method

Graham T. Allison, in his book *Essence of Decision: Explaining the Cuban Missile Crisis*, provides three frames of reference or models for evaluating the decision-making process. In chapter 3, these models will be used to examine the perspectives mentioned above. The following outlines the basic concepts in each decision-making model.

The Classical Model

The Classical Model is based on the choices of a unitary decision-maker. This decision-maker is assumed to be a rational actor who acts with sole regard given to value-maximizing the output. In other words, given a number of alternatives, the decision-maker will choose the alternative that best fulfills his needs or accomplishes his stated objectives. Also called the Rational Actor Model, the process includes four basic steps. First, the decision-maker determines his goals and objectives. Second, he examines the possible alternatives to accomplish the objectives. Third, he weighs the alternatives by determining the possible consequences of each. Finally, he makes a choice, or decision, based on the analysis of the alternatives.³⁴ Free from external influences, this model allows the decision-maker to view the evidence and make the most appropriate choice accordingly. The Classical Model, referred to as Model I, is the basis from which the other models are derived.

³⁴ Graham T. Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Cambridge, Mass.: Harper Collins Publishers, 1971), 29.

The Organizational Model

The Organizational Model, also known as Model II, views decision-making actions as “organizational output, partially coordinated by a unified group of leaders.”³⁵ This model acknowledges that decisions emerging from a large organization are not the product of a unitary, rational actor. Organizations are comprised of many elements or groups, each acting in its own self-interest. This self-interest is not borne from a desire to achieve political gains; rather, it serves as a self-defense mechanism that ensures the survival of the group and thereby ensures the survival of the organization as a whole. This model also states that, “to perform complex routines, the behavior of large numbers of individuals must be coordinated” through methods such as standard operating procedures (SOPs).³⁶ This suggests that decisions from leaders of large organizations are driven by factors that are not wholly within the leader’s control and that by virtue of this self-defense mechanism, organizational change is difficult and slow.

The Governmental-Politics Model

This model, also referred to as Bureaucratic-Politics or Model III, recognizes the fact that decision-makers do not operate in a vacuum. There are many external influences and conflicting interests that the decision-maker must weigh and act upon. Often sacrifices must be made with respect to one interest in order to achieve a positive outcome with another interest. Additionally, within this model, it is rare indeed when a decision truly

³⁵ *Ibid.*, 144.

³⁶ *Ibid.*

represents a value-maximized result. Professor Allison best sums up the Bureaucratic-Politics Model in the following manner:

The nature of...problems permits fundamental disagreement among reasonable men about how to solve them. Analyses yield conflicting recommendations. Separate responsibilities laid on the shoulders of distinct individuals encourage differences in what each sees and judges to be important. But the nation's actions really matter. A wrong choice could mean irreparable damage. Thus responsible men are obliged to fight for what they are convinced is right.³⁷

³⁷ *Ibid.*, 145.

Chapter 3

Analysis

Objectives vary considerably in war, and the choice of them depends chiefly upon the aim sought, whether the command of the air, paralyzing the enemy's army and navy, or shattering the morale of civilians behind the lines. This choice may therefore be guided by a great many considerations—military, political, social, and psychological.

Douhet

The above observation made by Giulio Douhet illustrates the fact that the choices we make with regard to military operations depend on a variety of factors, many of which we have no control over. Even the seemingly rational choices made without regard to external influences are indeed not made in a vacuum. There are also times when we must execute a mission with the resources we have been provided, without the opportunity to effect the decision-making process.

This chapter explores the various factors surrounding the propeller versus jet controversy and highlights the dilemma of accomplishing a military mission with technology that may or may not be appropriate to that mission. It is important to remember that this is not an examination of Graham Allison's models of decision-making. Rather, it is an examination of fielding appropriate military technologies as advanced by Harry Aderholt and William Momyer. It is an examination of the factors that influenced the controversy in question using Graham's Models as the analytical lenses. Chapter 2 provided a look at the players central to the controversy, their

background and experiences, and the demanding mission they were asked to accomplish in Southeast Asia. This chapter will draw on those observations to show how individual perceptions shaped the way they made decisions with respect to employing appropriate military technology. It has been said, “Where you stand depends on where you sit.” This aphorism is certainly evident in the propeller versus jet controversy.

The Controversy: A First Look

The Model I Lens

Recall from the last chapter that Model I decisions typically come from a rational unitary actor who weighs alternatives and selects from a variety of choices that alternative which best fulfills his needs or accomplishes his stated objectives.³⁸ In the case of the propeller versus jet controversy, the primary decision-maker was Momyer, as he was Aderholt’s superior officer in the chain-of-command. Momyer was responsible for all air operations in the skies over Southeast Asia—an awesome responsibility indeed. As part of that responsibility, Momyer was faced with the military objective of interdicting the NVA along the Ho Chi Minh Trail. He was also faced with a history of missions that were designed specifically to achieve that objective. Momyer, as the presumed rational actor in this study, was responsible for weighing the evidence and employing the technology most appropriate for the particular mission. This section will examine how well he did just that.

To do so, we must first address some important questions. Specifically, why did Aderholt argue that his propeller-driven aircraft were more appropriate for the

interdiction mission? What led him to believe that his “junkyard air force” could be more effective in slowing the flow of men, supplies, and equipment down the Ho Chi Minh Trail? Why did jet aircraft represent a more appropriate alternative for Momyer? Why did Momyer believe they were more effective than propeller-driven aircraft? The chief discriminator lay in what both Aderholt and Momyer considered to be their measures of effectiveness. Momyer and Aderholt weighed each measure of effectiveness differently. The result was that each believed that he was making the rational choice. The measures of effectiveness used were (1) targets destroyed; (2) cost; and (3) aircraft capability.

Targets Destroyed

If the primary mission of the interdiction campaign was to impede the NVA logistics flow along the Ho Chi Minh Trail, then an appropriate measure of effectiveness might be the number of NVA transports (trucks and watercraft) destroyed along the Trail. From this standpoint, it would be logical to assume that the greater the number of transports destroyed, the more effective the interdiction campaign. Both jet and propeller-driven aircraft were used in this effort.

The 606th Air Commando Squadron (ACS) assigned a variety of enemy targets for its T-28Ds to strike. The following is a sample of those targets and the results of the air strikes as reported in the squadron’s weekly activity report: 14 truck parks—14 secondary fires; 2 gun positions—2 gun positions damaged; 6 small-arms gun positions—6 small-arms gun positions destroyed; 1 bridge—1 bridge destroyed; 4 storage areas—1 building

³⁸ Allison, 33.

damaged, 1 building destroyed.³⁹ Air strikes made by A-26s also proved to be very effective. “The Seventh Air Force flew more than 3,000 sorties against the trail in December (1966) and destroyed or damaged 194 trucks. Although the A-26s flew only 195 of the total sorties (fewer than 7 percent), they tallied an incredible 126 of the 194 confirmed truck kills...roughly 64 percent of the trucks.”⁴⁰ Impressive as these results were, Momyer, in late 1966, rightly urged caution when evaluating the effectiveness of a military operation. “We are going to have to look at results produced over a long period of time rather than any dramatic accomplishment that will come from the single employment of the force.”⁴¹

Additional results were reported throughout 1967. A report by the Office of the Secretary of Defense (OSD) claimed that, during the period of January through August 1967, propeller-driven aircraft (A-26s and T-28Ds) destroyed 12.8 transport targets for every 100 sorties flown. During the same period, jet aircraft (F-4s and F-105s) destroyed only 1.5 transports for every 100 combat missions flown.⁴² “The impressive results not only proved the [propeller-driven aircraft] could operate effectively against the trail, but supported Aderholt’s contention they were the *best weapon for the job* (emphasis added).”⁴³ Additionally, the impressive AC-130 gunship proved to be quite effective, so much so that General Westmoreland, COMUSMACV (Commander, United States

³⁹ 606 ACS (Lucky Tiger) Activities, 4 January – 29 March 1967 (Maxwell AFB, Ala.: Air Force Historical Research Agency, File K-SQ-A-CMDO-606-SU-RE-U)

⁴⁰ Trest, 194.

⁴¹ Jacob Van Staaveren, *USAF in Southeast Asia; Interdiction in Southern Laos 1960-1968* (Washington, D.C.: Center for Air Force History, 1993), 195.

⁴² Michael E. Haas, *Apollo’s Warriors: United States Air Force Special Operations during the Cold War* (Maxwell AFB, Ala.: Air University Press, 1997), 207.

⁴³ Trest, 195.

Military Assistance Command, Vietnam), noted in December 1967 that the “truck-kill” rate was very high; above anything recorded the previous year.⁴⁴ Though not normally considered part of the “junkyard air force,” the propeller-driven fixed-wing gunships were used extensively in the interdiction role. “As the North Vietnamese sought the shelter of night, the Americans developed specialized systems for tracking and destroying trucks in the dark. Foremost among these were the fixed-wing gunships which...substantially overcame the inability to operate at night that had limited earlier interdiction efforts.”⁴⁵

Designed as an area defense platform from the military version of a DC-3, the AC-47 was the first dedicated fixed-wing gunship to be employed in Southeast Asia and flew its first combat mission in December 1965. The aged AC-47 was soon replaced by the gunship versions of the C-119 Boxcar and the newer C-130 Hercules. Designed specifically for aerial interdiction, as well as armed reconnaissance, the AC-119 and AC-130 gunships were employed in Southeast Asia with varying success.⁴⁶ The AC-130 proved to be far more effective than the AC-119, and its predecessor—the AC-47. “By the end of 1967...evaluation showed the [AC-130] a three-fold improvement over its predecessor.”⁴⁷ This led Major General William G. Moore, Air Force Deputy Chief of Staff, Research and Development, to exclaim: “The C-130 gunship had unprecedented success in identifying and destroying enemy lines of communication...far exceeding fighter type kill ratios on enemy trucks and other equipment.”⁴⁸

⁴⁴ Jack S. Ballard, *Development and Employment of Fixed-Wing Gunships 1962-1972* (Washington, D.C.: Office of Air Force History, United States Air Force, 1982), 135.

⁴⁵ Mark, 336.

⁴⁶ Ballard, 28-33, 262.

⁴⁷ *Ibid.*, 89.

⁴⁸ *Ibid.*

Additional studies seemed to confirm the value of propeller driven aircraft in the role of interdiction platform. A Project CHECO (Contemporary Historical Evaluation of Combat Operations) report on the interdiction campaign concluded the following with regard to the A-26s and gunships: “These interdiction operations have helped seal off the overland infiltration routes. In weight of effort it has grown massive; in tactics, it has achieved a real measure of efficiency; in total effectiveness, it has proved a necessary adjunct to an integrated interdiction program.”⁴⁹

But, propeller-driven aircraft were not the only assets assigned targets along the Ho Chi Minh Trail. Although the majority of air taskings for jet aircraft were concentrated in North Vietnam, some jet aircraft strike packages focused on the interdiction campaign in Laos. “In March 1967, six B-52s and six F-4Cs made nighttime strikes. In their preliminary strike report, Seventh Air Force analysts characterized strike results as ‘excellent’ and the B-52 and tactical missions were flown as planned.”⁵⁰

Thus, propeller-driven and jet aircraft both reported successes in their attacks along the Ho Chi Minh Trail. The degree of success varied and this was a fact that Momyer had to weigh. There also were other factors that had to be considered in evaluating the effectiveness of the interdiction effort, including cost effectiveness.

Cost

The total number of transports destroyed was not the only measure of effectiveness used to evaluate the most appropriate technology for the interdiction mission. Air Force

⁴⁹ Melvin F. Porter, “Night Interdiction in Southeast Asia,” *Project CHECO (Contemporary Historical Evaluation of Combat Operations) Report*, Headquarters PACAF, Directorate, Tactical Evaluation, CHECO Division, 45-46.

⁵⁰ Van Staaveren, 204-5.

analysts also examined the costs involved in executing the interdiction campaign. Here, two types of cost will be discussed. The first criteria is the cost per aircraft type to destroy a transport target; specifically, the combined operations and maintenance expenditure to generate each aircraft sortie multiplied by the number of sorties required to damage or destroy one target equals the cost per target. Second, cost is examined in terms of risk management. Specifically, propeller-driven aircraft are compared to jet aircraft in terms of the potential for incurring a loss to enemy air defenses.

Returning to the above OSD report, in the case of the first type of cost, “propeller-driven aircraft (A1-Es) destroyed or damaged 996 vehicles...at a rate of 12.8 transport targets destroyed per 100 sorties and at a cost of \$55,000 per target.”⁵¹ Examination of the cost incurred by jet aircraft revealed that jet aircraft (F-4s and F-105s) “destroyed or damaged only 336 vehicles...at a rate of 1.5 per 100 sorties and at a cost of \$700,000 per transport target.”⁵² Likewise, a May 1968 memorandum sent to the Assistant Secretary of the Air Force, Robert H. Charles, detailed the cost effectiveness of interdiction aircraft. Of 1,156 A-26 sorties flown, a total of 1,281 vehicles were damaged or destroyed at a cost of \$5,900 per vehicle. By comparison, out of 2,836 F-105 sorties flown, only 262 vehicles were damaged or destroyed at a cost of \$118,000 per vehicle.⁵³

On the other hand, with respect to the second form of cost—the risk that enemy air defenses posed to propeller-driven aircraft versus jets—and once again returning to the OSD report, analysis showed that propeller-driven aircraft were “four times more

⁵¹ *Ibid.*, 242.

⁵² *Ibid.*

⁵³ Ballard, 99.

vulnerable to enemy antiaircraft fire” than jets.⁵⁴ The question then should be asked, what was the level of the antiaircraft threat at the time and what amount of risk was the leadership prepared to accept to achieve its desired results? This is an important factor to consider in determining acceptable cost. The antiaircraft threat along the Ho Chi Minh Trail was far less in 1966-67 compared to subsequent years. At that time, the greatest antiaircraft threat was in North Vietnam. Aderholt claimed that the Ho Chi Minh Trail represented a more permissive environment for propeller-driven aircraft compared to North Vietnam. Moreover, Aderholt said he would not have considered sending anything other than jet aircraft to Hanoi or Haiphong.⁵⁵ It should be noted that even with the increased vulnerability of the propeller-driven aircraft to antiaircraft artillery, the replacement cost of propeller-driven aircraft was low compared to the F-4. This, of course, assumes that the vintage propeller-driven aircraft could easily be replaced. Nevertheless, the OSD report concluded that, “Even with a healthy margin for error factored in...the [replacement] cost ratio in favor of propeller versus jet strike aircraft was impressive.”⁵⁶

Such a disparity between the costs of jet and propeller-driven aircraft cannot be overlooked. However, the greater cost of employing jet aircraft might be worth the expenditure if the stakes involved were high enough. This is an example of *prospect theory*. (Though there is no evidence that prospect theory entered into Momyer’s decision-making calculus, it is, nevertheless, an important factor that can contribute to the difficulty in fielding military technology in the future.) Robyn Dawes, in *Rational Choice*

⁵⁴ Van Staaveren, 242.

⁵⁵ Aderholt, interviewed by author, 11 April 2000.

in an Uncertain World, describes prospect theory as behavior, sometimes irrational, based on the avoidance of a greater loss.⁵⁷ For example, in a high stakes scenario, the cost of using jet aircraft would be justified if, in prospect, the loss of military objectives could be avoided. If, for instance, national survival were at stake, the cost of ensuring survival may be high but acceptable.

Consider the more practical side of the argument. For Momyer, the vintage aircraft used by the 56th ACW represented a maintenance and logistics nightmare. The parts required to maintain the aircraft were not similar to any other in the Southeast Asia Theater. Moreover, the parts that were available, whether in theater or not, were in short supply due to the age of the aircraft. Additionally, the antiaircraft threat along the Ho Chi Minh Trail was certainly bound to increase over time. To Momyer, use of jet aircraft was more cost effective in the long term.

Capability

In determining the most appropriate technology for a given military mission, aircraft capability should certainly be considered. A technologically advanced aircraft serves no purpose for the mission if it is unable to perform or is inadequate for the environment in which it is assigned. This concept was not lost to US Marine Corps General Vernon E. Megee in his June 1965 U.S. Naval Institute Proceedings article, *The Genesis of Air Support in Guerrilla Operations*. General Megee wrote: “The ideal aircraft for ... guerrilla operations will be a specialized type, light, durable, highly maneuverable, with speed a secondary consideration (emphasis added), operable from turf runways, with

⁵⁶ Haas, *Apollo's Warriors*, 207.

versatile armament.”⁵⁸ His argument was that these aircraft attributes were more appropriate to the small wars environment given the nature of guerilla warfare. Megee was no stranger to the small wars environment and was well versed in what is commonly termed “low intensity conflict.” He was a co-author of the Marine Corps’ Small Wars Manual.⁵⁹

As Megee suggested, some aircraft characteristics that should be considered when evaluating capabilities include speed, altitude, combat radius, loiter time, maneuverability, and armament to name a few. A particular characteristic that may be an advantage in one circumstance could very well prove to be a disadvantage in another. For example, a jet’s speed may allow it to arrive where needed in short order and limits its exposure to enemy ground fire. However, it also precludes the pilot from operating within confined terrain or flying in a manner that allows the pilot to visually acquire targets in a dense tropical environment. Momyer conceded in his book, *Airpower in Three Wars*, “The greatest percentage of targets...were not visible to the fighter pilot because of terrain, jungle cover, or speed of the aircraft (emphasis added); usually it was a combination of all three.”⁶⁰ Such dichotomies were apparent throughout the propeller versus jet controversy. Aderholt admitted in his recently published biography, “Once you

⁵⁷ Robyn M. Dawes, *Rational Choice in an Uncertain World* (Fort Worth: Harcourt Brace College Publishers, 1988), 44.

⁵⁸ Vernon E. Megee, General, USMC, “The Genesis of Air Support in Guerrilla Operations.” *U.S. Naval Institute Proceedings* (June, 1965), 59.

⁵⁹ *Ibid.*, 58.

⁶⁰ Momyer, *Air Power*, 270. In situations where the attack pilot could not visually acquire the target due to terrain, foliage, or aircraft speed, the forward air controller (FAC) would “identify and mark the targets with wing-mounted smoke marker rockets. The FAC would also pass along corrections or other poststrike information.” See Jeffrey

took politics—the divisive roles and missions polemic with the Army over air-ground capabilities and budget battles for future force requirements—off the table, there remained the simple fact that jet and prop aircraft had distinctive characteristics making them both useful in combat.”⁶¹ The question still remains, however, in what environment is the jet or propeller-driven aircraft more appropriate?

The operating environment for air interdiction with respect to the Ho Chi Minh Trail was not one particularly friendly to pilots of jets and propeller-driven aircraft alike. In this unforgiving environment, aircrew skill and aircraft capability could easily translate into success or failure, depending on the appropriateness of the weapon system to the mission. A stark example of how aircraft capability was decisive in this regard was the defense of Lima Site 36 on 28 April 1967.

“Lima Site 36 was a small but strategic post in Northeastern Laos that served as a staging site for search and rescue helicopters and an aerial resupply point for friendly guerrillas.”⁶² The site had come under attack by NVA troops and was in danger of being lost to the enemy. However, jet aircraft responding to the attack were “unable to deliver ordnance due to low overcast skies” at the site. On the other hand, A-1E aircraft from the 602d Fighter Squadron, Commando, received word of the attack and were diverted to the site. Encountering the same overcast weather conditions, the first A-1E aircraft, callsign Dragonfly 21, descended through the cloud deck leaving his wingman, Dragonfly 22, at a

D. Glasser, *The Secret Vietnam War; The United States Air Force in Thailand, 1961-1975* (Jefferson, N.C.: McFarland and Company, Inc., 1995), 72.

⁶¹ Trest, 12.

⁶² Melvin F. Porter, “Second Defense of Lima Site 36,” *Project CHECO (Contemporary Historical Evaluation of Combat Operations) Report*, Headquarters PACAF, Directorate, Tactical Evaluation, CHECO Division, 1-4.

higher altitude. Spiraling down through the clouds, Dragonfly 21 broke out at 200 feet above the ground where he was then directed by ground controllers to “attack anything outside of the compound.” As this single A-1E aircraft could not stave off the invasion alone, it had to “buy time” until reinforcements could arrive. “Knowing that the cloud deck would not allow strikes by jet aircraft, Dragonfly 21 had to [judiciously and] effectively deliver his ordnance”⁶³ on the attacking NVA while waiting for additional A-1Es to arrive.⁶⁴ “His gunnery pattern, restricted by ceiling and terrain, was so low that often he had to pull up, off his run...to avoid trees and hilltops.”⁶⁵ When Dragonfly 21’s ordnance was fully expended, he returned to an orbit above the clouds, whereupon Dragonfly 22 descended to the site to continue the effort. “Dragonfly 21 and 22 were, in actuality, over the target for the crucial one hour and five minutes that made the difference between saving and losing the camp during the initial assault.”⁶⁶

As this example illustrates, many of the aircraft characteristics mentioned above, such as low speed, long loiter time, and maneuverability, came into play at Lima Site 36 and were critical to the success of the mission. Lima 36 was in many respects representative of the challenge faced by interdiction aircraft along the Ho Chi Minh Trail.

Certainly other measures of effectiveness supported the use of jet aircraft in the interdiction role. For example, this might be the case in terms of cost and the vulnerability of the propeller-driven aircraft in a high threat environment. However, in early 1967 the greatest threat to aircraft was not along the Ho Chi Minh Trail, but rather

⁶³ *Ibid.*

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*, 5-6.

⁶⁶ *Ibid.*, 6.

in North Vietnam. As described earlier, Aderholt conceded that the effort in the North was “a different kind of war” and was not conducive to the use of propeller-driven aircraft. The Ho Chi Minh Trail, at that time, represented a more appropriate environment for propeller driven aircraft compared to the North.⁶⁷

Logistical concerns for the propeller-driven aircraft weighed heavy on Momyer’s mind. As 7th Air Force commander, he was responsible for all aircraft in Southeast Asia. While the propeller-driven aircraft may have been more effective against targets along the Ho Chi Minh Trail, their cost effectiveness and sustainability was in question. They were cheaper to operate than jet aircraft, but only in the short term. Momyer, taking the long view, was concerned with providing the limited vintage aircraft with much needed parts from a dwindling supply. Aderholt and Momyer were still at odds over the appropriate technology for the mission. To shed further light on the dilemma, a study of Allison’s second model may prove useful.

The Controversy: A Second Look

The Model II Lens

Momyer’s differing approach to the use of propeller-driven aircraft in the interdiction role along the Ho Chi Minh Trail reflected more than just a difference of opinion with the Air Commandos’ leader. Both Momyer and Aderholt brought to the controversy a cultural perspective that biased their otherwise rational thinking. Though from the same service, the two individuals could not be more different. In short, the organizations from which we are nurtured can skew the way in which we look at the world.

⁶⁷ Aderholt, interviewed by author, 11 April 2000.

Gareth Morgan, in his book *Images of Organization*, wrote: “Organizations are mini-societies that have their own distinctive patterns of culture and subculture.”⁶⁸ He also asserted that cultures typically refer to “a society’s system of knowledge, ideology and values...and day-to-day ritual. Organization is itself a cultural phenomenon...and just as individuals in a culture can have different personalities while sharing much in common, so too with groups and organizations.”⁶⁹ This assertion is certainly descriptive of the relationship between Momyer and Aderholt and the organization they were from. While both were officers in the larger Air Force organization, their cultures within that organization, namely the fighter community and special operations community, were wholly different.

Allison’s Model II suggests that, in the organizational process paradigm, “The characterization of...action as organizational output differs sharply from Model I.”⁷⁰ Decisions from organizational leaders tend to be the sum total of inputs from various elements within the organization. In other words, the organizational leader represents not a “monolithic” actor, but “rather a constellation of loosely allied organizations on top of which [the] leader sits.”⁷¹ This section will address how certain organizational factors influenced the propeller versus jet controversy in general, and Momyer specifically, and how Aderholt was, in turn, affected.

⁶⁸ Gareth Morgan, *Images of Organization* (Newbury Park, Calif.: SAGE Publications, 1986), 121.

⁶⁹ *Ibid.*, 112, 120-121.

⁷⁰ Allison, 68.

⁷¹ *Ibid.*, 79-80.

Within an organization, “primary responsibility for a narrow set of problems encourages organizational parochialism.”⁷² This parochialism “is enhanced by: selective information available to the organization; recruitment of personnel into the organization; tenure of individuals in the organization; small group pressures within the organization; and distribution of rewards by the organization.”⁷³ Being the strong-willed, very individualistic leader he was, Momyer was firm in his beliefs that stemmed from his tactical air background.

For example, “During a rare visit to Nakhon Phanom, Momyer exploded upon learning that for the past three years his jet fighters (and prop aircraft) had been directed on targets in Laos by enlisted personnel and nonrated officers [known as Butterfly Forward Air Controllers or FACs].”⁷⁴ The Butterfly FACs flew in Laos aboard the CIA’s Air America liaison aircraft directing strikes in support of the counterinsurgency effort. “Momyer immediately replaced the Butterflies with Raven FACs, who were rated Air Force officers.”⁷⁵ (Raven FACs typically flew small, propeller-driven O-2 or OV-10 aircraft to seek out and identify potential strike targets. Once a target was identified, the FAC would relay the information to an Airborne Command and Control Center [ABCCC] for strike approval).⁷⁶ Following this incident, Aderholt observed that “the rules became so rigid, nobody could FAC Air Force jet fighters but other jet pilots.”⁷⁷ The author could find no data that suggested the Raven FACs were any more effective

⁷² *Ibid.*, 81.

⁷³ *Ibid.*

⁷⁴ Trest, 193.

⁷⁵ *Ibid.*.

⁷⁶ Momyer, *Air Power*, 86.

⁷⁷ Trest, 193.

directing strikes compared to the Butterfly FACs. Momyer's actions very well may have been motivated by a concern for safety and a desire to maintain a common reference for strike aircraft capability; however, his decision gave the impression of parochialism with regard to selective recruitment of personnel into the organization.

The unusual command arrangement between Seventh Air Force, the 56th ACW, and the US Embassy in Laos also served to exacerbate the already strained relationship between Momyer and Aderholt. The Air Commandos reported to and received taskings from the commander of Seventh Air Force (Momyer) in Saigon, but logistical operations and support came from Thirteenth Air Force. Also, all air activities within Laos had to be coordinated through the US Embassy.⁷⁸ A hybrid organization, known as the 7th/13th Air Force, was established to manage the coordination between each of these agencies. Momyer commented that the command relationship with the Ambassador in Laos was especially complex and difficult. "The Ambassador, as the senior US official, was responsible for all US military activities; consequently, all air operations came under the surveillance and control of the embassy."⁷⁹ Trest echoed the command and control difficulties, "[An] unresolved doctrinal bias during Momyer's tenure was the control that Ambassador Sullivan exercised over air operations in Laos. Because Aderholt worked closely with the country team in Vientiane, the ambassador was well briefed on the superior support he received from the Air Commandos and the devastating results they achieved on the Ho Chi Minh Trail."⁸⁰ Momyer was not particularly thrilled with sharing this information and he certainly was not happy with sharing control of his resources.

⁷⁸ History, 56th Air Commando Wing, 8 April-30 June 1967, (K-WG-56-HI), 1.

⁷⁹ Momyer, *Air Power*, 85.

But, this command arrangement was flawed before either men arrived at their posts. In 1964, “efforts to interdict the trail evolved into a political struggle between Seventh Air Force and the American embassy in Vientiane when Ambassador Sullivan began to question both the weight of effort applied against the trail and its failure to stem the flow of enemy traffic.”⁸¹

The independent actions by Aderholt and the coordination requirements with Vientiane tested Momyer’s patience as he sought to maintain control over his forces. Exercising control in a large organization can be a very large challenge. Though responsible and accountable for the actions of an organization, a leader at times does not have full control over organizational processes. This organizational “inertia” is not a concept that sits well with military commanders and this situation was no exception. “Governmental action requires decentralization of responsibility and power. But problems do not fit neatly into separable domains. Thus the necessity for decentralization runs headlong into the requirement for coordination.”⁸² Thus, “A no-nonsense, autocratic commander, General Momyer ruled by the book in Vietnam and brooked no argument from subordinates. Momyer’s autocratic control of the [56th Air Commando] Wing’s combat operations not only showed disdain for the men and the mission, but manifested intense dislike for their strong-willed commander.”⁸³

This “intense dislike” Momyer had for Aderholt stemmed from what Allison termed “structural variables.” For example, “The relations among [those in]

⁸⁰ Trest, 184, 4.

⁸¹ *Ibid.*, 188.

⁸² Allison, 85.

⁸³ Trest, 4, 184.

organizations...depend critically on a number of structural variables, including the nature of the job; performance measures and information available to...leaders; system of rewards and punishments for organizational members; and procedures by which human and material resources get committed.”⁸⁴ These structural variables were evident in Momyer’s dealings with Aderholt. With respect to the “system of punishments for organizational members,” Aderholt was made well aware of what Momyer could dish out. “Because both [Aderholt] and the array of vintage aircraft were sent to Nakhon Phanom over Momyer’s objections, Aderholt was treated differently from other wing commanders. This was conspicuous to all when Momyer *barred Aderholt from attending Seventh Air Force commanders’ conferences* (Emphasis added).”⁸⁵ Momyer was not enamored with Aderholt’s methods of interdiction, which generally were contrary to his own. Regarding the structural variable that deals with “procedures by which human and material resources get committed,” Warren Trest, in his biography of Aderholt, commented that “the only thing holding [the 56th ACW] back was a lack of resources and a very short leash at Seventh Air Force headquarters.”⁸⁶

Much in the same way that structural variables affect the way in which decisions are made, Allison suggests that organizational decisions are shaped by constraints that define acceptable behavior.⁸⁷ “[The] constraints are formulated as imperatives to avoid roughly specified discomforts and disasters. For example, the behavior of each of the U.S. military services seems to be characterized by effective imperatives to avoid things such

⁸⁴ Allison, 86.

⁸⁵ Trest, 192.

⁸⁶ *Ibid.*, 197.

⁸⁷ Allison, 82.

as a decrease in dollars budgeted, a decrease in manpower, or encroachment of other services on that service's roles and missions.”⁸⁸ These imperatives steer the decision-maker down a path that, while avoiding the “discomforts,” does not represent a rational decision given the alternatives. For example, with limited budgets, or a high demand for resources in a particular area, organizational leaders will choose not to devote time, talent, or treasure to efforts they believe are not worthwhile. When confronted with the efficacy of Air Commandos on the whole, Momyer observed that “many senior airmen...questioned the wisdom of investing in such [special air warfare] units.”⁸⁹ Momyer was expressing a belief that many of his contemporaries in the “organization” shared. “The tactical air leaders were convinced that high-performance jet fighters could perform effectively across the spectrum of armed conflict. They looked upon counterinsurgency in the Vietnam War as an aberration and upon Air Commandos as throwbacks to a bygone era.”⁹⁰

This organizational bias based on resource preservation was also apparent in a confrontation that Aderholt had with the commander of Tactical Air Command (TAC), General Walter C. Sweeney. Sweeney and Aderholt saw the role and worth of Air Commandos in very different ways. Like Momyer, Sweeney's allegiance was to the jet-centric organization and no “cowboy” was going to be allowed to change the direction or character of the organization.

By command, General Sweeney was a major force in the development of the Air Force doctrine designed to counter the major cold war threat to the US: the Soviet air force. Without hope of matching the Soviets'

⁸⁸ *Ibid.*

⁸⁹ Momyer, *Air Power*, 10.

⁹⁰ *Ibid.*, 4.

numerical superiority, the Air Force was committed to meeting that threat with an ultramodern, all-jet force using the latest technology. Given the finite funding available, it was not a commitment that looked kindly on the diversion of vital resources to other purposes, such as the military “aberration” steadily growing in Southeast Asia.⁹¹

Momyer, not unlike Sweeney, exhibited “organizational-think” in his dealings with the interdiction campaign along the Ho Chi Minh Trail, but he personally believed, for the reasons stated, that his approach better served the greater war effort. To act otherwise would be contrary to what Momyer, and many others, “knew” was right. Whether his approach was due to organizational personality, parochialism, inertia, structural variables, or constraints on acceptable behavior, Momyer was driven away from accepting propeller-driven aircraft as an appropriate technology for the interdiction mission.

The Controversy: A Third Look

The Model III Lens

To many Americans, the term politics connotes an unholy process. For some, it conjures up an image of smoke-filled back rooms full of deceitful people who act for no other reason than to further their own personal agendas. While this certainly may be true in some instances, politics on the whole is nothing more than a process of interaction between parties to achieve an objective. The process itself need not be underhanded or deceitful. It is a process of give and take to achieve one’s ends. Fred Harris, a former US Senator and now Professor of Political Science at the University of New Mexico, defined politics in the following way: “Politics is the process by which individuals and groups

⁹¹ Haas, *Apollo’s Warriors*, 192.

seek to secure and preserve their share of power or authority.”⁹² Harold Lasswell defines politics more succinctly: “[It is] the process of who gets what, when, and how.”⁹³

With this in mind, Model III “sees no unitary actor but rather many actors as players—players who focus not on a single strategic issue but on many diverse ...problems as well.”⁹⁴ In that light, “The complex political factors and the equally complex command organization in Vietnam led to many misconceptions about the interdiction campaign. Some viewed it as separate operations—the bombing in North Vietnam, the interdiction of the Ho Chi Minh Trail, and the attacks against the roads in South Vietnam.”⁹⁵ These “misconceptions” about the interdiction mission manifested themselves in the way resources were allocated to the different elements of the campaign. And although Momyer claimed to be conducting a single, integrated interdiction campaign that encompassed each of the target areas, his attention was divided among these competing interests with priority given to the effort in North Vietnam.⁹⁶ This resulted in few alternatives made available to Aderholt.

Momyer, however, was not the only one versed in things political. A recalcitrant Ambassador Sullivan resorted to exercising his own political muscle. “Sullivan decided to use his influence with [Secretary of Defense] McNamara to obtain a dedicated force of propeller-driven attack aircraft to counter the enormous increase in North Vietnam’s truck traffic on the Ho Chi Minh Trail. The ambassador lost patience with the military’s

⁹² Fred R. Harris, *America’s Democracy: The Ideal and The Reality* (Glenview, Ill.: Scott, Foresman and Company, 1980), 15.

⁹³ Gary Wasserman, *The Basics of American Politics* (Boston: Little, Brown and Company, 1982), 4.

⁹⁴ Allison, 144.

⁹⁵ Momyer, *Air Power*, 174.

persistence in sending high-performance jet aircraft...that obviously didn't work.”⁹⁷

Unfortunately for the Air Commandos, this effort yielded few results.

Model III also describes actors as “players who make decisions not by a single, rational choice but by the pulling and hauling that is politics.”⁹⁸ The result is compromise and priority-setting that may leave one party wanting. Such was the case with Aderholt's Air Commandos and Ambassador Sullivan. “The Ambassador never felt that enough airpower was being devoted to the war [along the Ho Chi Minh Trail]. His argument was one frequently heard from an organization wanting sole control of airpower to support its missions.”⁹⁹ Note here the concept of control as was reflected in the definition of politics. In order to maintain this control, Momyer claimed, “If airpower had been divided as the Ambassador proposed, there would have been insufficient forces for the other missions.”¹⁰⁰

As mentioned previously, “Where you stand depends on where you sit.” Just as perspectives vary depending on culture, so too they vary depending on one's “stakes” in the fight. Model III describes actors as “players who act in terms of no consistent set of strategic objectives but rather according to various conceptions of national, organizational, and personal goals.”¹⁰¹ Different leaders defined the war, military objectives, and methods of achieving those objectives differently. In his book, *Air Power in Three Wars*, Momyer noted that early in 1964 this political infighting was evident.

⁹⁶ *Ibid.*

⁹⁷ Trest, 188-189.

⁹⁸ Allison, 144.

⁹⁹ Momyer, *Air Power*, 87

¹⁰⁰ *Ibid.*

¹⁰¹ Allison, 144.

Although the Joint Chiefs agreed that the U.S. would have to intervene if South Vietnam were to be saved, they were not in complete agreement on precisely how we should intervene. The Air Force Chief of Staff argued for a concentrated attack against targets in the heart of North Vietnam. The Army Chief of Staff thought it necessary for U.S. troops in South Vietnam to take on more of the combat role. And Secretary McNamara believed the main roles of airpower should be close air support and interdiction in Laos.¹⁰²

The varying conceptions of objectives and how to achieve them was endemic in the military leadership at the time. This was true for Momyer as well, as he would fight the same battles during his tenure at Seventh Air Force.

The concept of politics as a process for achieving personal recognition, furthering one's gains, or maintaining control or power did not elude Momyer. This fact did not elude Aderholt either. For example, "A Seventh Air Force directive changing the wing's reporting procedures appeared deliberately designed to suppress the 56th Wing's outstanding results against enemy trucks in Laos. When the reports were consolidated and forwarded to Air Force headquarters, the wing's truck kills were lumped with those of the other wings and were credited to their jet aircraft."¹⁰³ One could argue that this was merely an administrative change driven by factors unrelated to the controversy. However, the political timing of the change was certainly fortuitous for the jet aircraft advocates. "The change in reporting procedures was doubly suspicious, coming at a time when the Pentagon was debating whether jet aircraft or propeller-driven aircraft were more effective in the war."¹⁰⁴

¹⁰² Momyer, *Air Power*, 13-14.

¹⁰³ Trest, 208.

¹⁰⁴ *Ibid.*, 209.

Recognizing what had transpired, Sullivan volunteered to intervene on Aderholt's behalf. "The ambassador told Aderholt that he was going back to Washington and would be conferring with President Johnson. He asked permission to raise the issue of his difficulties with General Momyer. Aderholt asked the ambassador not to bring up the matter, because he did not want to embarrass the Air Force or to give the appearance of using political influence."¹⁰⁵ Thus, one of Aderholt's deputy commanders, Colonel Lee Volet, made the observation in October 1967, "...Aderholt was unpolitical [sic] to a fault and was concerned 'only for the welfare of his men, the accomplishment of the missions assigned to the wing, special air operations, and helping the Thais that lived around the base'."¹⁰⁶ Aderholt's character came through in this instance. As integrity and loyalty were his hallmark, his desire to accomplish the mission and follow his superiors, even those with whom he disagreed, took priority over "settling a score."

Whether or not Aderholt was as altruistic as Volet made him out to be is debatable, however, he seemed continually to find himself embroiled in a political tug-of-war. One such case involved a visiting Senator from Missouri who was on a fact-finding trip for the Senate Armed Services Committee. The Senator was none other than Stuart Symington, the former Secretary of the Air Force. Symington received a briefing at Nakhon Phanom on A-26 operations. Aderholt was in attendance.¹⁰⁷

In the middle of the briefing, Symington turned to Aderholt and asked, "Are you trying to tell me this A-26 is better than the F-4s we are building in St Louis?" Aderholt said, "Senator Symington, I'm not trying to tell you anything. We are just briefing the facts." Symington said, "What you are telling me is that your airplane is better." "No, sir, those are your

¹⁰⁵ *Ibid.*, 202.

¹⁰⁶ *Ibid.*, 185.

¹⁰⁷ *Ibid.*, 200.

words. All we are doing is comparing the record on operations in Laos,” Aderholt insisted. He admitted afterward, “none of us knew they manufactured the F-4 in Symington’s district.”¹⁰⁸

As comical as this encounter may seem, it illustrates the fact that even in our attempts to act as rational players in the decision-making process, we are always subject to what Allison called the “pulling and hauling that is politics.”¹⁰⁹

Conclusion

The appropriate technology dilemma for those charged with fighting the interdiction campaign along the Ho Chi Minh Trail in 1967 was replete with challenges to a rational decision-making calculus. Measures of effectiveness that included numbers of targets destroyed, cost, and aircraft capability was not enough to convince the Air Force leadership that propeller-driven aircraft represented the most appropriate technology for that time and mission. As it was, interdiction efforts along the Ho Chi Minh Trail in 1967 were secondary to bombing efforts in North Vietnam. The propeller versus jet controversy is therefore a testament to the fact that decisions on military force employment involve organizational and political influences. Some of these influences we can control while we are at the mercy of others. Whether it is parochialism or structural variables that drives our decisions, or the influences of power politics, we must understand the consequences of the decisions we make.

In the end, Air Force leadership “remained reluctant to [accept specialized] aircraft. [They] preferred the type of aircraft that [they believed] could handle all...missions. This meant high-performance jet fighter-bombers. To devote money and other resources to a

¹⁰⁸ *Ibid.*

¹⁰⁹ Allison, 144.

special aircraft designed for [single missions] seemed inappropriate.”¹¹⁰ Never gaining an appreciation for what propeller-driven aircraft contributed to the interdiction effort, Momyer relieved Aderholt of his command before his scheduled rotation.¹¹¹ With this, the propeller versus jet controversy came to an end. However, thirty years later, the appropriate technology dilemma would reappear—with different players.

¹¹⁰ Benjamin Franklin Cooling, *Case Studies in the Development of Close Air Support* (Washington, D.C.: Office of Air Force History, 1990), 418.

¹¹¹ Haas, *Apollo's Warriors*, 208.

Chapter 4

PARALLELS

The...great requirement in the organizing of air power is the creation of suitable aircraft and equipment for the men that have to fly them.

Billy Mitchell

Three decades have passed since the Aderholt and Momyer propeller versus jet controversy, yet the appropriate technology dilemma still plagues the modern day Air Commandos within Air Force Special Operations Command (AFSOC). Within the last decade, the 6th SOS has struggled to acquire the appropriate aircraft needed to accomplish its mission. The 6th SOS was designed as an aviation FID squadron and its founders sought to marry the appropriate technology to the mission. The 6th SOS can therefore be regarded as a case study in aviation technology vis-à-vis the FID mission. In the 1960s, Aderholt argued that reciprocating and turbo-prop technology was better suited to the counterinsurgency (COIN) mission than jets. A euphemism, FID is essentially COIN in disguise.¹¹² Thus, the 6th SOS sought to realize Aderholt's original thesis.

The 6th SOS challenge is an analogue for today's AFSOC. Headquarters AFSOC currently wrestles with force structure decisions on what weapon systems will be relevant

¹¹² Jerome Klingaman, 6th SOS Director of Tactics and Plans, remarked, "I found out very quickly when I was assigned to the [National Security Council] working group that if you used in an open forum words like counterinsurgency or revolutionary war, you'd get

for the future. Those charged with strategic planning for AFSOC find themselves faced with the same challenges as Aderholt and the 6th SOS with respect to the appropriate technology dilemma. Lieutenant Colonel John Geis, AFSOC's chief of long-range planning, remarked, "By 2015, the skies over enemy territory will be too dangerous for propeller-driven planes."¹¹³ This remark comes at a time when AFSOC prepares to field a fleet of new propeller-driven aircraft that will remain in the inventory well beyond 2015. This suggests that the propeller versus jet controversy is alive and well.

This chapter will examine the quest by the 6th SOS to procure appropriate technology and highlight the difficulty with which AFSOC searches for appropriate technology as it plans the future of Air Force special operations aviation.

The 6th Special Operations Squadron

The 6th SOS is a combat aviation advisory unit. Its primary mission is to advise and train foreign aviation units in airpower employment and sustainment. Airpower doctrine development and force structure are also areas in which the squadron advises.¹¹⁴ With respect to the squadron's mission, Jerome Klingaman, a squadron founder and now 6th SOS Director of Tactics and Plans, suggested that because the US has reduced its military force structure, it has placed greater emphasis on the strength of allies and coalition partners. This, in turn, places a greater emphasis on the Air Force's training, advising,

taken to the bathroom and have your mouth washed out with soap. So 'Foreign Internal Defense' worked great." Interviewed by author, 12 April 2000, Hurlburt Field, Florida.

¹¹³ Bruce Rolfsen, "Stealthy Future? Special Operations Command considers its aircraft needs," *Air Force Times*, 21 February 2000, 27.

¹¹⁴ Joint Special Operations Institute, *Special Operations Forces Reference Manual* (Fayetteville, N.C.: Cubic Applications, 1998), 50.

and assessing capabilities.¹¹⁵ Major John Hill anticipated Klingaman's observation when he wrote, "The move to a multipolar world will mean a greater emphasis on those activities that support nation building and stability...[and] for AFSOF...more emphasis on FID."¹¹⁶

Klingaman is no stranger to the appropriate technology dilemma and he enjoys a unique perspective on the propeller versus jet controversy because he has first-hand experience with the 6th SOS and the Vietnam-era 56th ACW. He became an Air Commando in 1965 and subsequently served as a Raven FAC¹¹⁷ and commanded and advised a Cambodian AT-28 strike force during the Vietnam War. Klingaman remarked that in early 1967, Air Force leadership saw in its future an all jet-force, and that the "old oil-streaked relics" of the 56th ACW were not part of the Air Force's plan. He went on to say, "That stigma affected us (6th SOS) when we stood up this squadron."¹¹⁸ Lieutenant Colonel Wray Johnson, another founding member of the 6th SOS, observed, "AFSOC FID planners advocated the procurement of airplanes ideally suited to the aviation-FID mission; however, these aircraft were rejected because they did not comport with the acceptable notion of a front-line weapon system."¹¹⁹

¹¹⁵ Klingaman.

¹¹⁶ Major John A. Hill, USAF, *AFSOF: A Unique Application of Aerospace Power* (Maxwell AFB, Ala.: Air University Press, April 1993) 16.

¹¹⁷ See Chapter 3, note 23, and page 24 for definition and discussion on forward air controllers (FAC).

¹¹⁸ Klingaman.

¹¹⁹ Lieutenant Colonel Wray R. Johnson, "Ends Versus Means; The 6th Special Operations Squadron and the Icarus Syndrome" *Air Chronicles*, Spring 2000, n.p.; on-line, Internet, 9 June 2000, available from <http://www.airpower.maxwell.af.mil/airchronicles/cc/WJohnson.html>.

To understand the roots of the squadron's dilemma, one must first understand the "customers" the 6th SOS supports. Typically, the countries that the squadron advises are third-world or developing countries with a government friendly to the US that face "a threat to...internal stability and security in the forms of subversion, lawlessness, or an insurgency."¹²⁰ For economic reasons, among others, these countries typically do not have advanced aircraft in their inventories. Geographic areas that are host to such threats are generally rural, isolated, and sparsely populated. As a result, the outlying airfields from which the host nation's aircraft operate do not have runways that will support heavy aircraft requiring long take-off or landing rolls. Therefore, the aircraft used by these countries are small, light, and propeller-driven aircraft.¹²¹

Currently, the 6th SOS maintains two types of aircraft. The first is the fixed-wing Spanish built Casa 212. The second is the Bell UH-1N helicopter. It has only been in the recent past that these aircraft have been assigned to the 6th SOS. The original concept of operation for the squadron did not involve deploying aircraft "down-range" with the advisors.¹²² The aircraft were needed to fly locally to keep aircrew and maintenance personnel current in a weapon system that was similar to that of the host countries and could operate in similar environments. More importantly, they needed to be proficient in an aircraft for credibility and safety reasons. Host-nation air forces would not give much credence to an advisor team that could not climb in the seat along side their own

¹²⁰ Hill, 6.

¹²¹ Major Michael C. Koster, USAF, *Foreign Internal Defense; Does Air Force Special Operations Have What it Takes?* (Maxwell AFB, Ala.: Air University Press, December 1993), 11-13, 18.

¹²² "Down-range" is a term used by many advisors in the 6th SOS to mean "in the host country."

aircrew.¹²³ Perhaps most importantly was the “need for aircraft that exemplify the multi-dimensional characteristics most useful to Third World air forces in the exploitation of airpower.”¹²⁴ With such aircraft, the 6th SOS could better develop the tactics, techniques, and procedures needed in the FID environment.

The aircraft sought by the founding members of the 6th SOS were suitable to austere third world conditions in that they were short take off and landing capable and relatively inexpensive to acquire, operate, and maintain. Of the many candidates evaluated, the best were considered to be the Pilatus PC-6 Turbo-Porter, the Ayres Vigilante V-1-A, and the Basler Turbo 67, all of which “display characteristics and capabilities *appropriate* for host-country and FID operations (emphasis in original).”¹²⁵ The unique characteristics of these aircraft are striking, making it easy to envision the utility of these aircraft in the FID environment. For example, the Pilatus Porter boasts a 2,200-pound payload and can take-off in as few as 646 feet. It has an endurance of nearly four-and-a-half hours with internal fuel only. Its operationally ready rate is 98 percent and cost per flight hour is only \$139. The Ayres Vigilante boasts a 99 percent operationally ready rate and costs only \$175 per flight hour to operate. It needs only 1,250 feet of runway and has an amazing 7-hour duration. On the slightly heavier side, the Basler Turbo has a 13,000-pound payload with a 950 nautical mile range with standard fuel configuration. Requiring only 1,296 feet for take-off, it can operate from most third world airstrips. The Basler has a 98 percent operationally ready rate and costs only \$92 per flight hour to operate.¹²⁶ Compare these

¹²³ Klingaman.

¹²⁴ Johnson, *Ends Versus Means*.

¹²⁵ Koster, 56.

¹²⁶ *Ibid.*, 56-63.

figures to one of AFSOC's "front line" aircraft—the MC-130E Talon I. The Talon I has a range greater than 2,000 miles (without in-flight refueling) and a maximum operating weight of 155,000 pounds, but it requires a minimum runway length of 3,000 feet. It has an operationally ready rate of 75.1 percent and costs \$1,731 per flight hour to operate. AFSOC's heavy vertical lift alternative is the MH-53 Pave Low. The Pave Low has a range of 600 miles (without in-flight refueling) and a maximum operating weight of 46,000 pounds. Its operational ready rate is 63.7 percent and costs \$2,765 per flight hour to operate.¹²⁷

Unfortunately, as one observer has remarked, "alternative technology such as the Basler T-67 and Pilatus Porter simply do not fit into...AFSOC orthodoxy."¹²⁸ (In this case, as opposed to Aderholt's controversy, the opposition comes from within as opposed to opposition from the "conventional" Air Force. The point is that the difficulties in fielding appropriate technology do not only surface between differing Air Force organizations.) Though propeller-driven, most of the aircraft in the AFSOC inventory (e.g., AC-130 gunship, MC-130 transport, and MH-53 helicopter), represent high-technology aircraft designed for specific roles, which includes the role of choice for AFSOC—direct action.¹²⁹ Unfortunately for the 6th SOS, the FID role does not fall into this paradigm. As a critic pointed out, "It would be unthinkable to deny Army special

¹²⁷ *Ibid.*, 85, 89.

¹²⁸ Johnson, *Ends versus Means*.

¹²⁹ *Direct action* is defined by USSOCOM as "short-duration strikes and other small-scale offensive actions by SOF to seize, destroy, capture, recover, or inflict damage on designated personnel or material in denied areas." (See *Special Operations in Peace and War*, United States Special Operations Command Publication 1, 25 January 1996, p 3-2.) Direct action, like FID, is one of the principal special operations missions for USSOCOM

forces or Navy SEALs (Sea, Air, and Land) the tools required to accomplish their mission, or to deny AFSOF direct-action crews the platforms they need, or to prohibit training on these systems; yet this is the very position taken by many in the SOF community with respect to aviation FID and the 6th SOS.”¹³⁰

When asked about the opposition to the aircraft acquisition, Klingaman suggested it might be competition for acquisition and operating funds at AFSOC; however, he pointed out that the flying hour cost of the Casa 212 and UH-1N (the aircraft the squadron currently fly) “[don’t] even come up on the radar scope.”¹³¹ In other words, the cost of operating the alternative aircraft (Basler T-67, Pilatus Porter, etc.) is substantially lower in comparison to existing systems (Casa 212 and UH-1) and pales in comparison to AFSOC’s “front-line” aircraft (MC-130 and MH-53) as previously shown. Klingaman conceded that he could not say exactly why there was such deep-seated opposition to having aircraft...no one ever gave him a specific reason.¹³² Perhaps the opposition from AFSOC was not due to funding, but due to something else. Johnson hypothesized that the reason for lack of higher headquarters support was the “commitment to the conventional warfare paradigm.” He also asserted that the “concomitant tendency to seek high-tech platforms is often a debilitating one in [low-intensity conflict]. The inability to recommend appropriate alternatives was arguably the result of an institutional

but receives a great deal more command emphasis (in terms of organization and training of AFSOC squadrons) than does FID.

¹³⁰ Lieutenant Colonel Wray R. Johnson, “Whither Aviation Foreign Internal Defense?” *Airpower Journal* (Spring 1997), 80.

¹³¹ Klingaman.

¹³² *Ibid.*

predisposition toward sophisticated, conventional platforms.”¹³³ Finally, he went on to write, “The leadership are constrained by their respective institutional cultures to think in terms of unique, one-of-kind weapons that fit into their particular worldview.”¹³⁴

Fielding aircraft appropriate to the FID mission is critical to the original vision, and continuing mission, of the 6th SOS. The types of aircraft deemed most appropriate (the Pilatus, the Ayres, and the Basler) were denied. Instead, less appropriate aircraft (the Casa 212 and the UH-1N) have been assigned. While these aircraft fulfill some of the need (that of pilot proficiency), they do not fulfill the whole need. In the meantime, the 6th SOS does what it can to fulfill its mission. Some squadron aircrew are forced to fly with agencies outside of the 6th SOS so that they are familiar with aircraft that more closely resemble that of the host countries. When directed, and based on customer need, advisors from the squadron will seek out and fly non-standard aircraft such as the Mi-17, Super Puma, and An-26.¹³⁵ Every aircraft that 6th SOS members can acquaint themselves with, that is appropriate for the mission and similar to the host-country aircraft, aids the squadron in becoming a more applicable force in the FID role. Klingaman summed up the argument with an eye on the future by saying that if the 6th SOS is to get the aircraft appropriate to the FID mission, it must educate the AFSOC community on the importance of the FID mission and the contribution the 6th SOS makes to that end. “Our challenge is to visibly demonstrate that we are of important utility to the...command.”¹³⁶

¹³³ Johnson, *Ends versus Means*.

¹³⁴ *Ibid.*

¹³⁵ Klingaman.

¹³⁶ *Ibid.*

Air Force Special Operations Forces of the Future

Similar to Aderholt's challenge thirty years ago and much like the dilemma for the 6th SOS during the last decade, so too AFSOC faces difficulties in fielding appropriate technology. The previous section reflected the 6th SOS as an analogue to AFSOC. Now consider the implications of the appropriate technology dilemma for AFSOC as a whole. With the earlier comments by Geis regarding the risk to propeller-driven aircraft at a time when AFSOC is bringing more of these aircraft into the inventory, the propeller versus jet controversy is ever apparent. The familiar adage seems to apply: "The more things change, the more they stay the same."

Now more than ever, AFSOC is working hard at restructuring its forces to be relevant in the future. Consider the following aircraft in the AFSOC inventory. In addition to the meager FID assets previously mentioned, AFSOC has various models of the Lockheed C-130 to include the AC-130H/U gunships, the MC-130E/H Talon I/II, and the MC-130P Combat Shadow air refueling platform. Additionally, the command has Sikorsky MH-53 Pave Low special operations helicopters. Beginning in the very near future, AFSOC will receive the first of 50 Bell-Boeing CV-22 Osprey tiltrotor aircraft, which take off and land like a helicopter and cruise like a turbo-prop fixed-wing aircraft. The 50 tiltrotor aircraft will eventually replace some of the C-130s and the helicopters.¹³⁷ The special operations helicopter missions will become the sole responsibility of US Army Special Operations Command (USASOC). The Pave Low fleet will be drawn down prior to the full fielding of the Osprey. This action will provide additional research

and development and acquisition money for tomorrow's special operations aircraft. The difficulty comes in determining what aircraft will be appropriate for the future.

Lieutenant General Charles Holland (then Major General and commander of AFSOC), in an interview with the author, suggested that current funding levels are good in AFSOC for weapon systems acquisition. However, he cautioned that AFSOC must maintain a balance between funding weapons modernization programs and providing operating capital for current operations around the globe. General Holland also commented that the nature of the international security environment suggests that SOF will fill a niche in the future.¹³⁸ The challenge for AFSOC is deciding what role it will play in the future international environment and what weapon systems will best serve the command in that role.

AFSOC's acquisition of the tilt-rotor is contrary to the future vision of Geis and his team in AFSOC Long-range Plans. And it is not just the Osprey that is the target of Geis' argument. *All* of AFSOC's propeller-driven aircraft will be at risk by 2015 as anti-aircraft systems and integrated air defense systems (IADS) technology improves. He cites a Russian surface-to-air missile system that is effective at acquiring airborne targets as low as one meter above the ground and out to a distance of 240 miles.¹³⁹ Additionally, Geis commented that "during the next 15 years, enemy armies will be able to set up more

¹³⁷ "AFSOC CV-22 Command Management Action Plan," 15 August 1998, CD-ROM, Headquarters AFSOC, Directorate of Plans, Programs, and Acquisition Management, Hurlburt Field, Fla.

¹³⁸ Major General Charles Holland, USAF, Commander AFSOC, interviewed by author, 14 May 1999, for research on the risks and rewards of fielding the CV-22 by this author.

¹³⁹ Lieutenant Colonel John Geis, USAF, Chief, AFSOC Long-range Plans, telephone interview with author, 30 May 2000.

effective anti-aircraft batteries and night-vision goggles will be standard issue.”¹⁴⁰

Current defensive techniques for propeller-driven aircraft, such as low-level flight and terrain masking,¹⁴¹ may not work in the future. Complicating the dilemma is the fact that making propellers stealthy is technologically very difficult.

Geis’ answer to this dilemma is to acquire stealth jet aircraft for AFSOC, dubbed the MC-X, that are capable of hauling troops just as a C-130 would. A gunship variant of the same concept, called the AC-X, is also being studied.¹⁴² “The MC-X will have to carry cargo, land behind enemy lines, and refuel other aircraft in flight. The next generation gunship could strike ground targets with a laser beam modeled on the current day airborne laser system.”¹⁴³ As Geis wrote in his article, “The Air Force hasn’t set aside money for the plane’s development, but Geis expects planning dollars for the formal ‘analysis of alternatives to be in the 2002 budget’.”¹⁴⁴

He concedes that the C-130 will not go away. Geis’ crystal ball shows continued unrest in areas such as Sub-Saharan Africa, as well as other locales, and providing humanitarian relief in a semi-permissive environment would be appropriate for the C-130 in 2015.¹⁴⁵ Interestingly enough, Sub-Saharan Africa also represents a FID environment that likely will be better tackled by Basler equipped 6th SOS advisors than CV-22 equipped aircrew.

Aderholt advocated technology appropriate to the need, but was unable to overcome opposition vested in a wholly different world-view. That problem persists in

¹⁴⁰ Rolfsen, 27.

¹⁴¹ Terrain masking is a method of concealment in which the aircraft is flown where terrain is between the aircraft and the enemy threat.

¹⁴² Geis.

¹⁴³ Rolfsen, 27.

¹⁴⁴ *Ibid.*

AFSOC as evidenced by the experience of the 6th SOS. More importantly, AFSOC as a whole is facing the challenge of looking ahead and securing appropriate technology in the context of the needs of the future. AFSOC must use caution when confronting this challenge. Institutional culture, prejudice, and other factors will increase the difficulties in fielding appropriate military technology. The fact that the CV-22 is coming on-line at a time when the future planner claims that “prop-jobs” are archaic bespeaks a disconnect within the command’s strategic thinking. The appropriate technology dilemma has not been resolved.

¹⁴⁵ Geis.

Chapter 5

conclusion

The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish...the kind of war on which they are embarking, neither mistaking it for, nor trying to turn it into something that is alien to its nature. This is the first of all strategic questions and the most comprehensive.

Carl von Clausewitz

Know the enemy, know yourself; your victory will never be endangered.

Sun Tzu

Students of military strategy often cite the above maxims with reckless abandon. Pause is not given to consider the true import of the message. With respect to the appropriate technology dilemma, the great strategists' message certainly rings true. If one genuinely seeks to understand the nature of the conflict and conduct an honest appraisal of one's own capabilities as well as that of one's enemies, decisions made governing weapons of choice will be clear—or so it would seem.

The appropriate technology dilemma presents a great challenge for the commander, strategist, and force structure planner. The desire to make the rational choice and field technology appropriate to the mission is a strong one, particularly when a great deal is at stake. Choosing the “right tool for the job” should simply be a matter of defining one's objectives, evaluating the alternatives, and choosing that option that will best suit the

need. However, the options brought before the decision-maker, the external influences on the decision-maker, and the manner in which he makes a decision is anything but a simple process.

This study examined the propeller versus jet controversy as an illustrative example of the difficulties involved in fielding technology appropriate to the mission, particularly when the mission does not comport with that of the prevailing force. Understanding these difficulties is paramount if military strategists are to achieve their objectives. An otherwise rational decision-maker is influenced by organizational and bureaucratic factors that shape the ultimate decision and impact mission success.

The mission presented to “Spike” Momyer and “Heinie” Aderholt from 1966-67 was interdiction of the NVA logistics lifeline along the Ho Chi Minh Trail. Options for accomplishing that mission included fielding propeller-driven or jet aircraft against the NVA. The rational decision-making calculus included weighing the alternatives by some measure of effectiveness to choose the technology most appropriate to the mission. Targets destroyed, cost, and aircraft capability were the measures of effectiveness used to evaluate the alternatives. This is where the decision-making waters were muddied. “Where you stand depends on where you sit.” Momyer and Aderholt had very different perspectives on how best to accomplish the mission due to their varied backgrounds and experiences. What was clearly the rational choice for one reflected an irrational choice for the other, even when faced with the same measures of effectiveness. However, had the two officers seen eye to eye on the most appropriate technology, external influences would probably still have led them on divergent courses.

Organizational and political factors have a great influence on the otherwise rational decision-maker. This was evident in the propeller versus jet controversy. Whether the final decision was a result of structural variables, parochialism, or the “pulling and hauling” of political interaction, common ground was never achieved. The nature of the Vietnam War in the mid 1960s changed from what Aderholt’s Air Commandos originally faced. As 7th Air Force commander, Momyer was faced with much more than simply the interdiction campaign along the Ho Chi Minh Trail. He had to take the long view and fight a war that was growing ever more “conventional.” Aderholt left Southeast Asia at the end of 1967 and portions of his “junkyard air force” soon followed. However, the propeller versus jet controversy would reemerge in the future.

The 6th SOS faced its own appropriate technology dilemma. Much like Aderholt, the unit’s founders sought to marry technology appropriate to the foreign internal defense mission. This quest was hampered by Model II and Model III influences on Air Force Special Operations Command. The “rational” alternatives sought by the 6th SOS included aircraft such as the Pilatus Porter, the Ayres Vigilante, and the Basler 67. These aircraft represented technology that was considered most appropriate to the Third World FID environment. While no one can say for sure why there was, and perhaps still is reluctance in AFSOC to embrace the FID mission and the technology to accomplish that mission, one can say with some confidence that the mission of the 6th SOS does not comport with the prevailing AFSOC mission of direct action.

The appropriate technology dilemma is evident today within Headquarters AFSOC. A new propeller versus jet controversy is brewing as current acquisitions and future planning do not see “eye-to-eye” on technology that is relevant for the future. By the end

of the decade, AFSOC will have acquired a fleet of propeller-driven aircraft, albeit high-tech, in the form of the CV-22 Osprey tiltrotor. This comes at a time when AFSOC long-range planners assert that the future threat environment in 2015 will not be conducive to the use of propeller-driven aircraft. This disconnect in command strategic thinking does not bode well for the future. What AFSOC strategists must do, first, is “establish the kind of war on which they are embarking.” Second, a determination of the probable roles and missions in the future security environment is called for. Third, means must be matched to ends by fielding technology that is appropriate to the likely mission. The author acknowledges that this process is certainly not an easy one. No one’s crystal ball is without obscurations. However, understanding the influences on the rational decision-making process will illuminate for the strategist the difficulties in fielding appropriate weapons of choice.

Factors other than those borne from a rational decision-making process affect the way we field and employ weapon systems and therefore the weapons of choice may not represent the most appropriate technology for the mission at hand. This was evident in the propeller versus jet controversy in the mid 1960s; it was evident in the 1990s (and today) with respect to the 6th Special Operations Squadron; and is evident today as Air Force Special Operations Command, in planning for the future, confronts the “appropriate technology” dilemma. Military strategists and those charged with overseeing force structure, resources, and requirements are well advised to bear this in mind.

Bibliography

Books and Documents

- Allison, Graham T. *Essence of Decision; Explaining the Cuban Missile Crisis*. Cambridge, Mass: Harper Collins Publishers, 1971.
- Ballard, Jack S. *Development and Employment of Fixed-Wing Gunships 1962-1972*. Washington, D.C.: Office of Air Force History, United States Air Force, 1982.
- Builder, Carl H. *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force*. New Brunswick, N.J.: Transaction Publishers, 1994.
- _____. *The Masks of War: American Military Styles in Strategy and Analysis*. Baltimore, Md.: The Johns Hopkins University Press, 1989.
- Cartwright, Thomas F. *USAF Response to Insurgency in Developing Countries During the 1973-83 Time Period*. Maxwell AFB, Ala.: Air University Press, 1972.
- Chinnery, Philip D. *Any Time, Any Place; A History of USAF Air Commando and Special Operations Forces*. Annapolis, Md.: Naval Institute Press, 1994.
- Cooling, Benjamin Franklin, ed. *Case Studies in the Achievement of Air Superiority*. United States: Air Force. Center for Air Force History, 1994.
- _____, ed. *Case Studies in the Development of Close Air Support*. Washington D.C.: Air Force. Office of Air Force History, 1990.
- Dawes, Robyn M. *Rational Choice in an Uncertain World*. Fort Worth: Harcourt Brace & Company, 1988.
- Dean, Lt Col David J. *The Air Force Role in Low-Intensity Conflict*. Maxwell AFB, Ala.: Air University Press, October 1986.
- _____, ed. *Low-Intensity Conflict and Modern Technology*. Maxwell AFB, Ala.: Air University Press, Center for Aerospace Doctrine, Research, and Education, 1986.
- Futrell, Robert Frank *Ideas, Concepts, Doctrine; Basic Thinking in the United States Air Force 1961-1984*. Maxwell AFB, Ala.: Air University Press, 1989.
- Giap, General Vo Nguyen Giap *How We Won The War*. Philadelphia, Pa.: RECON Publications, 1976.
- Glasser, Jeffrey D. *The Secret Vietnam War: The United States Air Force in Thailand, 1961-1975*. Jefferson, N.C.: McFarland & Company, Inc., 1995.
- Haas, Col Michael E. and TSgt Dale K. Robinson. *Air Commando! 1950-1975: Twenty-five Years at the Tip of the Spear*. Air Force Special Operations Command, 1994.
- Haas, Col Michael E. *Apollo's Warriors: United States Air Force Special Operations during the Cold War*. Maxwell AFB, Ala.: Air University Press, 1997.
- Harris, Fred R. *America's Democracy; The ideal and the Reality*. Glenview, Ill.: Scott, Foresman and Company, 1980.

- Hill, Maj John A. *Air Force Special Operations Forces: A Unique Application of Aerospace Power*. Maxwell AFB, Ala.: Air University Press, April 1993.
- Holley, Irving Brinton, Jr. *Buying Aircraft: Materiel Procurement for the Army Air Forces*. Washington, D.C.: United States Army. Center of Military History, 1989.
- _____. *Ideas and Weapons*. Washington, D.C.: Office of Air Force History, 1983.
- Isaacson, Jeffrey A., Layne, Christopher, Arquilla, John. *Predicting Military Innovation*. Santa Monica, Calif.: RAND, 1999.
- Joint Special Operations Forces Institute. *Special Operations Forces Reference Manual*. Fayetteville, N.C.: Cubic Applications, Inc., 1998.
- Khong, Yuen Foong. *Analogies at War; Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965*. Princeton, N.J.: Princeton University Press, 1992.
- Kissinger, Henry. *Diplomacy*. New York: Simon & Schuster, 1994.
- Koster, Michael C. *Foreign Internal Defense: Does Air Force Special Operations Have What It Takes?* Maxwell AFB, Ala.: Air University Press, December 1993.
- March, James G. *A Primer on Decision Making: How Decisions Happen*. New York: The Free Press, 1994.
- Mark, Eduard. *Aerial Interdiction in Three Wars*. Washington, D.C.: Center for Air Force History, 1994.
- McMaster, H.R. *Dereliction of Duty*. New York: Harper Perennial, 1997.
- Mitchell, William. *Winged Defense; The Development and Possibilities of Modern Air Power—Economic and Military*. New York: Dover Publications, 1988.
- Meilinger, Col Phillip S. *10 Propositions Regarding Air Power*. Washington, D.C.: Air Force History and Museums Program, 1995.
- Mets, David R. *Land-Based Air Power in Third World Crisis*. Maxwell AFB, Ala.: Air University Press, 1986.
- Momyer, General William W. *Air Power in Three Wars*. Washington, D.C.: Department of the Air Force, 1978.
- Morgan, Gareth. *Images of Organization*. Newbury Park. Calif.: SAGE Publications, 1986.
- Neustadt, Richard E., May, Ernest R. *Thinking in Time; The uses of History for Decision Makers*. New York: The Free Press, 1986.
- Prados, John. *The Blood Road; The Ho Chi Minh Trail and the Vietnam War*. New York: John Wiley and Sons, 1999.
- Strategy and Force Planning*, edited by Strategy and Force Planning Faculty. Newport, R.I.: Naval War College Press, 1997.
- Sullivan, William H. *Obbligato: Notes on a Foreign Service Career*. New York: W.W. Norton & Company, 1984.
- Tilford, Earl H., Jr. *Search and Rescue in Southeast Asia, 1961-1975*. Washington, D.C.: Office of Air Force History, 1980.
- Trest, Warren A. *Air Commando One; Heinie Aderholt and America's Secret Air Wars*. Washington, D.C.: Smithsonian Institution Press, 2000.
- United States Air Force. *Basic Aerospace Doctrine of the United States Air Force*. AFM 1-1, 2 vols. Washington, D.C.: March 1992.
- United States Air Force. *Military Operations Other Than War*. AFDD 2-3, Washington, D.C.: October 1996.

- United States Air Force Special Operations Command. *Night Flyer Almanac*. Hurlburt Field, Fla.: Headquarters Air Force Special Operations Command, 1998.
- United States Joint Chiefs of Staff. *Joint Doctrine for Military Operations Other Than War*. Joint Pub 3-07, Washington, D.C.: June 1995.
- United States Special Operations Command. *Special Operations in Peace and War*. USSOCOM Pub 1, Washington, D.C.: January 1996.
- Van Staaveren, Jacob. *Interdiction in Southern Laos 1960-1968*. Washington, D.C.: Center for Air Force History, 1993.
- Vick, Alan, ed. *Preparing the U.S. Air Force for Military Operations Other Than War*. Santa Monica, Calif.: RAND, 1997.
- Waller, Douglas C. *The Commandos: The Inside Story of America's Secret Soldiers*. New York: Simon & Schuster, 1994.
- Wasserman, Gary. *The Basics of American Politics*. Boston: Little, Brown and Company, 1982.
- Worden, Col Mike. *Rise of the Fighter Generals: The Problem of Air Force Leadership 1945-1982*. Maxwell AFB, Ala.: Air University Press, March 1998.

Articles

- Cole, James L., Jr. "USAF Special Operations Forces: Past, Present, and Future" *Aerospace Historian*, Winter (December 1980): P218-226.
- Drew, Dennis "U.S. Airpower Theory and the Insurgent Challenge: A Short Journey to Confusion" *The Journal of Military History* (October 1998): P809-32.
- Johnson, Lt Col Wray R. "Ends Versus Means; The 6th Special Operations Squadron and the Icarus Syndrome" *Air Chronicles*, Spring 2000, n.p. On-line. Internet. Available from <http://www.airpower.maxwell.af.mil/airchronicles/cc/Wjohnson.html>
- _____. "Whither Aviation Foreign Internal Defense?" *Airpower Journal*, (Spring 1977): P67-86.
- Megee, Vernon E. "The Genesis of Air Support In Guerrilla Operations" *U.S. Naval Institute Proceedings*, (June 1965): P48-59.
- Olson, Dr. William J. "Air Power in Low-Intensity Conflict in the Middle East" *Air University Review*, P3-21.
- Rolfen, Bruce. "Stealthy Future? Special Operations Command considers its aircraft needs" *Air Force Times*, February 21, 2000, P27.
- _____. "Aircraft builders propose some smaller evolutionary steps" *Air Force Times*, February 21, 2000, P27.

Unpublished Sources

- 606 Air Commando Squadron (Lucky Tiger) Activities (4 January – 29 March 1967), K-SQ-A-CMDO-606-SU-RI-U, (Declassified) USAF Collection, AFHRA.
- Aderholt, Brig Gen Harry C. USAF Oral History Interview (U) (K239.0512-1716), 12-15 August 1986. (Secret) Published passages declassified (#61, 24 February 2000). USAF Collection, AFHRA.

History of 56th Air Commando Wing (8 April – 30 June 1967), K-WG-56-HI, (Declassified) USAF Collection, AFHRA.

Momyer, Gen William Wallace. USAF Oral History Interview. (U) (K239.0512-1068), 31 January 1977. (Unclassified) USAF Collection, AFHRA.

_____. USAF Oral History Interview. (U) (K239.0512-1468), 9 September 1981. (Unclassified) USAF Collection, AFHRA.

_____. Personal Papers 1914-1973. (U) (168.7041) (Unclassified) USAF Collection, AFHRA.

Project CHECO (Contemporary Historical Evaluation of Combat Operations) Report, Second Defense of Lima Site 36, 28 April 1967. (U) (K717.0413-12) (Declassified) USAF Collection, AFHRA.

Project CHECO Report, Night Interdiction in Southeast Asia, 9 September 1966. (U) (K717.1413-93) (Declassified) USAF Collection, AFHRA.

Taylor, Gen Maxwell D. USAF Oral History Interview. (U) (K239.0512-501), 11 January 1972. (Declassified) USAF Collection, AFHRA.

Interviews

Aderholt, Brig Gen Harry C., interviewed by author, Fort Walton Beach, Fla., 11 April 2000.

Geis, Lt Col John, Chief, Long Range Plans, Air Force Special Operations Command, Hurlburt Field, Fla., telephone interview with author, 30 May 2000.

Holland, Maj Gen Charles, Commander, Air Force Special Operations Command, Hurlburt Field, Fla., telephone interview with author, 14 May 1999.

Klingaman, Jerome, Director, Tactics and Plans, 6th Special Operations Squadron, Hurlburt Field, Fla., interviewed by author, 12 April 2000.